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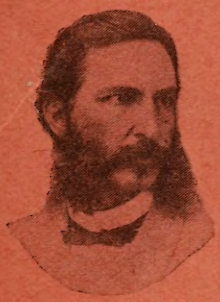
Vol. XXV. No. 10.



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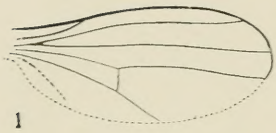
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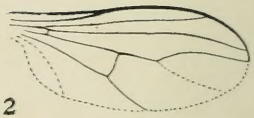
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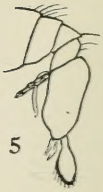
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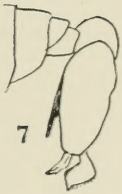
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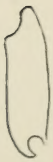
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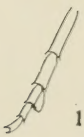
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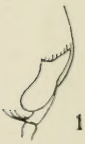
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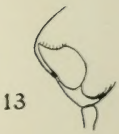
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NEW NORTH AMERICAN DOLICHOPODIDAE—VAN DUZEE.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXV. DECEMBER, 1914. NO. 10.

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New Species of North American Dolichopodidae (Dip.).

By M. C. VAN DUZEE, Buffalo, New York.

(Plate XVIII.)

Neurigona nigricornis n. sp. (Plate XVIII, Figs. 1, 4).

Eyes separated by the face in the male, antennæ and dorsum of the abdomen black, hypopygium and thorax reddish-brown. Length 2 mm.

♂. Face narrow, dark green or blackish-green; palpi and proboscis dark brown; front and occiput black; orbital cilia black, very short; antennæ black, third joint very small and clothed with rather long pubescence; arista, also with long pubescence. inserted near the base of the third joint; arista with two joints, the first of which is short.

Thorax, scutellum and metanotum reddish-brown, darker along the front of the thorax, at base of the scutellum and on the flattened space before the scutellum, the latter with a little gray pollen, the rest of the thorax shining; pleuræ pale yellow below, becoming more reddish above and with a black spot before the halteres; acrostichal bristles in two rows; scutellum with two long bristles.

Dorsum of the abdomen dark brown or black, sometimes the hind margins of the first and second segments pale; venter yellowish, in some specimens almost brown; hairs of the abdomen and the bristles on the hind margins of the first, second and fifth segments black; hypopygium and its appendages reddish-brown (Fig. 4).

Coxæ pale yellow, fore pair with minute black and several long but extremely delicate pale hairs on the front surface, and black bristles at tip; middle pair with black hairs and bristles near the tip in front; hind coxæ with a minute black bristle on the outer surface; legs yellow or yellowish-brown, femora paler especially at base; tarsi growing darker towards their tips; hind legs rather hairy; hairs on the femora mostly yellow; fore metatarsi three-fourths as long as their tibiæ; hind tarsi with the second joint longer than the first.

Halteres yellowish-brown with brown knobs; tegulæ yellow with their tips and cilia black, the cilia however appear yellowish-brown in certain lights.

Wings grayish hyaline; veins brown; costa black; last segment of the fifth vein about twice as long as the posterior cross-vein; third and fourth veins parallel beyond the cross-vein; tip of the fourth vein beyond the apex of the wing (Fig. 1).

Described from four males taken at Colden, Erie County, New York, August 3.

This species differs from all other known North American species in having the antennae and the cilia of the tegulae and orbit black, also in having the knob of the halteres and the tips of the tegulae infuscated. It resembles *N. dorsalis* described in this paper in the color of the abdomen and pleurae, also in size. The hypopygium of these two species when drawn out appears to be attached by a slender peduncle; *N. setosa* V. D. has about the same structure.

Neurigona dorsalis n. sp. (Plate XVIII, Fig. 3).

♂. Eyes contiguous; thorax metallic green or purple on the dorsum; flattened space before the scutellum not very conspicuous; hypopygium yellow, tipped with black; front tibiæ with black bristles. Length 2 mm.

Eyes meeting so as to almost obliterate the face; palpi with silvery white pollen; proboscis yellow; front blackish with gray pollen; ocellar bristles strong, divergent. Antennæ yellow, first joint with a few black bristly hairs above at apex, second joint short, third joint pointed, about as long as broad, infuscated along the upper edge; arista brownish, pubescent.

Dorsum of the thorax metallic green (in the type specimen reddish purple on the most of its surface), dulled with gray pollen; pleuræ

and humeri yellow, the former with a black spot in front of the halteres which connects with the black of the black metanotum; scutellum bronze-brown, black at base and on the lateral corners (in one specimen concolorous with the dorsum).

Dorsum of the abdomen greenish-black; more or less of the sides of the first and second segments and the venter yellow; hypopygium yellow, rather large, with conspicuous black outer, and equally large, yellow inner appendages (Fig. 3).

Coxæ and feet pale yellow, tips of the tarsi slightly darker; front coxæ with a few yellowish bristles on the anterior surface; in some lights these bristles appear brown; middle coxæ with a few black hairs on the front surface and one large black bristle on the outer surface; hind coxæ with one erect black bristle on the outer surface; fore tibiæ with a row of black bristles on top; these bristles, which are hardly as long as the diameter of the tibia, do not reach the base or tip; fore metatarsi hardly one-half as long as their tibiæ; hind femora with a black bristle on the outside near the tip; hind tarsi hardly as long as their tibiæ, with the first joint a little shorter than the second.

Tegulæ, their cilia and the halteres yellow.

Wings grayish, hyaline, narrowed at base, the anal angle being obsolete; last section of the fourth vein nearly straight, approaching the third vein towards the tip; posterior cross-vein about two-and-one-half times its length from the wing margin measured on the fifth vein; veins brown.

♀. One specimen from Ithaca, New York, seems to be the female of this species, but is in rather poor condition. The color is about the same as in the male except that the dorsum of the thorax is black where it is metallic in the male, but it seems to be a little greasy, and I take that to be the reason for the difference; it also has the row of small bristles on the fore tibiæ. The ovipositor is short and blunt, shining, and of a reddish-yellow color.

Described from two males, one taken by me on the trunk of a tree at Elma, Erie County, New York, on August 27; the other in the Cornell University collection, taken at Ithaca, New York, July 9. The female from Ithaca, New York, July 8.

This species runs to *tibialis* in the key of males in my paper on this genus, but in this species the hypopygium is large with the outer appendages black, while in *tibialis* the hypopygium is small with small yellow appendages.

While working up the genus *Neurigona* last year I rejected this species after describing it, as the flattened space in front of the scutellum is not as conspicuous as in most of the other species; the legs are somewhat stouter, and the first joint of

the antennae has several stout hairs above, but I hardly think that these differences justify the erection of a new genus. The form of the hypopygium is typical of *Neurigona,* and the third and fourth veins are converging, the acrostichal bristles in two rows, the body color partly yellow, and the flattened space can be traced quite readily.

Paraclius ovatus n. sp. (Plate XVIII, Figs. 5, 6).

♂. Length 3 mm. Face covered with silvery white pollen; the front and occiput dull green with white pollen, which is thicker on the former; antennæ reddish-yellow, third joint mostly brownish and somewhat pointed; arista brown, pubescent; cilia of the inferior orbit white.

Dorsum of the thorax metallic green, only thinly dusted with grayish pollen; pleuræ more blackish with white pollen; a large black bristle above the fore coxæ.

Abdomen metallic green with some coppery reflections, white pollinose on the sides below; hypopygium black (Fig. 5), somewhat shining, its lamellæ large, oval, yellowish-white with a narrow black border on the lower and apical edge (Fig. 6), ciliate with black hairs.

Coxæ yellow, the middle pair darkened on the outer surface; fore and middle coxæ with black hairs and bristles; hind coxæ with a bristle on the outer surface; legs yellow; the tarsi slightly darkened, middle femora with a preapical bristle; hind femora with two preapical bristles, one near the upper and one near the lower edge; fore tibiæ with a row of small and two large bristles; middle and hind tibiæ with a glabrous strip above between two rows of large bristles; hind tarsi longer than their tibiæ and with the first joint shorter than the second.

Tegulæ and halteres pale yellow, the former with black cilia.

Wings grayish hyaline; posterior cross-vein about its length from the wing margin measured on the fifth vein.

Described from two males from Decatur County, Georgia. Taken by Mr. M. D. Leonard, July 16 and 19, 1912.

Paraclius angulatus n. sp. (Plate XVIII, Fig. 7).

♂. Length 4 mm., length of wing 3 mm. Face wholly covered with snow-white pollen, narrowed in the center, being about as wide, a little above the middle, as the width of the third antennal joint; palpi, proboscis and antennæ black, the latter of moderate size, the third joint somewhat pointed, about as long as broad; arista with scarcely perceptible pubescence; cilia of the upper orbit black, of the lateral and inferior orbit white; front covered with grayish pollen.

Thorax, abdomen and coxæ dark metallic green, almost blackish-green; pleuræ and coxæ dull with whitish pollen; the spot of white

pollen in the sutural depression conspicuous. Abdomen with considerable white pollen along the sides, and with the posterior margins of the segments blackish in certain lights; hypopygium dull black; lamellæ black, rather large, with the outer part subquadrate and the slender stem at right angles to this outer part (Fig. 7).

Legs entirely black; fore coxæ with black hairs and bristles; femora with a slight greenish lustre; all the tarsi about as long as their tibiæ, the first joint of hind tarsi a little longer than the second.

Tegulæ and halteres yellow, the former with black cilia.

Wings strongly tinged with blackish, more hyaline on the basal and posterior portions; fourth vein ending close to the tip of the third vein, not at all recurved at tip.

♀. Differs from the male only in having the face broader and with the sides nearly parallel, and the pollen of the abdomen so laid on as to leave the hind margins of the segments and the center of the dorsum darker colored.

Described from three males and one female taken at Colden, Erie County, New York, August 3, 1913.

This species runs, in Prof. Aldrich's key, to *P. nigripes* Ald. and agrees with his description of that species in most points, but the lamellae of the hypopygium are large and angulated, while in *nigripes* they are small and rudimentary.

Peloropeodes flavipes n. sp. (Plate XVIII, Figs. 8, 9).

♂. Length 1.75 mm. Face wide above, narrowed below to about the width of the small black proboscis, thickly covered with grayish-white pollen, and with a subquadrate, brown spot above the palpi; palpi small, white; front broad, covered with gray pollen; cilia of the inferior orbit white, of the upper orbit black. Antennæ brownish black, about as long as the head and thorax, first and second joints short, third joint very long, somewhat flattened, tapering, with long pale pubescence (Fig. 8); arista apical, one-half as long as the third joint, with long pale pubescence, and with a minute black spine at tip. (This spine seems to represent the second joint of the arista.)

Dorsum of the thorax, scutellum and abdomen dark metallic green; dorsum of the thorax dulled with gray pollen, which is thickest along the fore part; pleuræ black with white pollen; scutellum with one pair of widely separated bristles; acrostichal bristles absent; other thoracic bristles well developed; hypopygium black, with only a few minute hairs and yellow appendages, hardly one-half as large as the abdomen (Fig. 9).

Legs yellow with very short hairs; tarsi scarcely darkened at the tips; fore coxæ yellow with a few pale bristle-like hairs on the front surface; middle and hind coxæ blackened at base; middle coxæ with

brown hairs on the front surface; middle tibiæ with two and hind tibiæ with three bristles on the upper surface; middle and hind femora with a preapical bristle.

Tegulæ yellow with black tips and brownish cilia; halteres yellow.

Wings grayish hyaline, with brown veins; rounded at tip.

Described from one male taken by Mr. Nathan Banks at Falls Church, Virginia, on May 30.

I place this little species in this genus as it is closely related to *P. salax* Wheeler, although his generic description would have to be modified to receive it, as this species has but two scutellar bristles and the wings are rounded at the tip. I should give the characters of the genus as: Antennae of the male as long as the head and thorax with thick terminal arista, third joint and arista pubescent, first joint bare above; hypopygium large, sessile, with small hook-like appendages; wings with the third and fourth veins parallel; sixth vein distinct; posterior cross-vein perpendicular to the wing margin, distant from the tip of the fifth vein about twice its length. Prof. Wheeler does not mention the bristles of the thorax, but in my species there are no acrostichal bristles; the other bristles are strong.

PSILOPIELLA n. gen.

Wings with the fourth longitudinal vein forked, and the sixth longitudinal vein present; posterior cross-vein twice its length from the wing margin, measured on the fifth vein; face of female wide, scarcely narrowed below; front wide, vertex not excavated; ocellar tubercle not prominent; there are ocellar, vertical and postvertical bristles; antennae with the first joint bare above, second joint with small bristles at apex, third joint short in the female, pubescent; arista dorsal, pubescent.

Thorax with a small flattened space before the scutellum; without acrostichal bristles; five dorsocentral, a humeral, a very small presutural, two notopleural, and a supraalar bristle, all these bristles rather small; a minute bristle above the fore coxae; scutellum with a pair of large bristles and a pair of small hair-like bristles outside of these.

Legs rather slender; hind coxae with an erect bristle on the outer surface; tibiae with one or two small bristles; first and

second joints of hind tarsi of equal length. Abdomen partly yellow.

This genus is related to *Leptorhethum* by the forking of the fourth vein, and the vertex not being excavated; to *Neurigona* still more closely by the bare first antennal joint, the flattened space before the scutellum and the yellow abdomen.

Type.—Ps. rutila n. sp.

Psilopiella rutila n. sp. (Plate XVIII, Fig. 2).

♀. Length 2 mm. Face and front wide, thickly covered with white pollen; palpi small, yellow with a few black hairs; antennæ yellow with the rounded third joint brown; arista brown; orbital cilia black above, white below.

Thorax reddish coppery, thickly covered with gray pollen; bristles black except the one above the fore coxæ, which is yellowish; pleuræ black with white pollen, and with the hind edge a little yellowish.

Abdomen yellow, shining, with blackish bands on segments 2 to 5.

Coxæ yellow with yellow hairs and bristles; erect bristle on the hind coxæ also yellow; each tibia with a small black bristle near the knee; tarsi blackish towards their tips.

Wings grayish hyaline; fork of fourth vein rather weak and in a straight line with the basal portion.

Described from one female taken at Bradentown, Florida, in March.

Medeterus emarginatus n. sp. (Plate XVIII, Fig. 10).

♀. Length, exclusive of the ovipositor, 5 mm., length of ovipositor 2 mm. Face, palpi, proboscis and front black; proboscis shining with several long pale hairs below and a row of short pale hairs along the edge; antennæ with the first joint reddish-yellow, second joint black, the third joint brownish-black with an apical arista; orbital cilia black above, pale below; four black bristles above the fore coxae.

Thorax black, but so thickly covered with brown pollen on the dorsum as to appear seal-brown with a broad, poorly-defined lateral stripe of darker on each side; acrostichal bristles rather large; on the front of the dorsum inside of the humeri is a space covered with short black bristles; scutellum and flattened space before, pleurae and coxae covered with gray pollen.

Abdomen black with gray pollen along the sides; ovipositor with two small yellowish lamellae and about six long slender hairs at tip.

Coxae and legs black; extreme tip of middle coxae and of all femora reddish-yellow; fore and middle coxae with black bristles at the tip; hind coxae with one bristle on the outer surface; fore coxae with a

circular emargination at tip; (Fig. 10) all femora with rather long hairs below; middle tibiae with a pair of small bristles at basal fourth; fore and hind tibiae without bristles; hind tarsi with the first joint a little more than half as long as the second.

Halteres pale yellow with the stem brown; tegulae whitish, bordered with brown, and with white cilia.

Wings grayish, hyaline; veins dark brown, a little paler at base of wing; posterior cross-vein and distal segment of fifth vein of about equal length.

Described from one female taken at Kearney, Ontario, July 6, 1909.

This runs in Wheeler's key to the species of this genus to *M. maurus* Wheeler, but differs from that species by the antennae having only the first joint yellow, no trace of bluish on the face or body, and by having brown pollen on the dorsum of the thorax. The emargination of the fore coxae is, I think, a character peculiar to this species.

The ovipositor in the described specimen is very much exserted; this may not be the case normally, but I think that it is.

Medeterus modestus n. sp.

♂. Length 2.75 mm. Altogether brownish black; face shining with a greenish luster in some lights, with gray pollen in the suture and along the orbits below the suture; proboscis shining black, moderately large; cilia of the lateral and lower orbits white; pleurae and coxae with white pollen.

Dorsum of the thorax with brown pollen and black bristles; two gray stripes are quite distinct on the forepart of the thorax in some specimens; scutellum with greenish reflections and with four marginal bristles.

Abdomen shining on the dorsum and with white pollen on the sides; hypopygium long and rather slender, the inner appendages somewhat yellowish.

Fore coxae with minute pale hairs on the front surface, those at the tip bristle-like; middle coxae with whitish bristles on the front surface; hind coxae with one erect whitish bristle on the outer side and three or four pale bristles above the fore coxae; second joint of hind tarsi about twice as long as the first.

Halteres brown on the outer surface, paler on the inner side in some specimens; tegulae and their cilia brownish.

Wings grayish, hyaline, a little yellowish at the root; veins dark brown or black, scarcely paler at the base of the wing; posterior cross-vein straight, about as long as the distal segment of the fifth vein.

♀. Length 3.25 mm., agrees with the male in all but sexual characters.

Described from two males and two females, taken at Avon, New Jersey, September 27, 1908, by Mr. H. S. Harbeck.

This species comes close to *M. nigripes* Loew, but has white bristles above the fore coxae; the halteres and cilia of the tegulae are brownish, and the fore coxae have minute but distinct white pubescence on their anterior surfaces, and pale bristles at their tips; while *nigripes* has black bristles at the tip of the fore coxae which are otherwise bare, the bristles above them are also black; the halteres and cilia of the tegulae are whitish in *nigripes*, and the first joint of the hind tarsi is shorter in proportion than in this species.

Medeterus lobatus n. sp. (Plate XVIII, Fig. 11).

♂. Length 2.3 mm. Proboscis and palpi small, brown; face rather wide, metallic green; front blue, narrowly green along the orbits; antennae black, first and second joints of about equal length, third joint about half as long as the second and rounded at tip, pubescent; arista apical, about as long as the height of the head, pubescent; orbital cilia black above, pale below; the bristle at the upper corner of the eye large, curved forward.

Thorax and abdomen metallic green with coppery reflections, and some bluish reflections on the pleurae and forepart of the dorsum; thorax thinly gray pollinose; acrostichal bristles small, in two rows; humeral bristle large; three dorsocentral, a posthumeral, one notopleural, a presutural, and a postalar bristle, all black and rather large; a small yellowish bristle above the fore coxae; scutellum yellow below with four large bristles, the outer pair the smaller.

Hairs of the abdomen pale; hypopygium long, black, the basal part somewhat metallic, the outer part opaque, appendages rather long, yellow.

Fore and middle coxae metallic green on their front surfaces with yellow tips; hind coxae green at base; all the hairs and bristles of the coxae pale, including the bristle on the outer surface of the hind coxae; legs yellow; tips of the tarsi scarcely darkened; hind femora with about five slender bristles near the base on the upper edge, and a row of four stouter bristles on the outer surface towards the tip; hind tibiae with two bristles at basal third and one preapical bristle, all on the upper surface, also a row of yellow hairs on top which are longer towards the tip; middle tibiae with two bristles at basal third; fore tarsi longer than their tibiae, the second joint slightly enlarged,

third joint with a flattened lobe on the front side, this lobe nearly as large as the joint (Fig. 11); middle tarsi longer than their tibiae; hind tarsi about the same length as their tibiae, with the first joint nearly two-thirds as long as the second and with a bristle at tip below.

Tegulae, their cilia, and the halteres yellow.

Wings hyaline, strongly tinged with yellowish-brown back as far as the fourth and fifth veins, leaving a broad hind margin hyaline; veins brown; venation typical of the genus; posterior cross-vein one and a half times it length from the wing margin, measured on the fifth vein.

Described from one male, taken by Mr. H. S. Harbeck, at Barnegat City Junction, New Jersey, on August 11, 1910.

This interesting little species is related to *M. aberrans* Wheeler, which was also taken in New Jersey, it having the small proboscis and bright metallic coloring of that species.

Asyndetus harbeckii n. sp. (Plate XVIII, Figs. 12, 13).

♂. Length 3.25 mm. Face subquadrate, metallic green with thin gray pollen; palpi very small, brown with brown hairs; front metallic green with coppery reflections in the center, shining; antennae black, third joint brown; second joint long, arcuated, with a bristly basal projection; third joint large, flattened, with short pubescence, rounded below, with two points at apex, attached to the second joint near the center of the upper edge; arista inserted near this central point, distinctly pubescent. (The third joint in the type specimen is larger in the left than in the right antenna; it is hard to say which is the normal form. Figs. 12 and 13). Orbital cilia short and black above, below forming a rather thick beard of a sordid white color.

Thorax metallic green with coppery reflections on the front of the dorsum; pleurae and scutellum more blue-green, the former with brown pollen; bristles of the thorax large; acrostichal bristles in an irregular row; scutellum with a pair of large medial and a pair of small outer bristles.

First three segments of the abdomen dark bluish-green, the last two more bronze-black; hairs of the abdomen long, black, those at the sides of the base longest; hypopygium small, with small black appendages, bristles at the tip rather large.

All the coxae black with black hairs and bristles; fore coxae somewhat greenish at base; all femora metallic green, shining, ciliate with bristlelike black hairs below; fore tibiae and metatarsi yellow, fringed with long blackish hairs on the outer upper edge; last four joints of the fore tarsi short with a few stout hairs at the tip of the fifth joint; middle and hind tarsi black; middle and hind tibiae with two bristles above, inserted at first and second thirds.

Tegulae and their cilia whitish; halteres brown with a whitish knob. Wings grayish, hyaline; venation about as in *S. syntormoides* Wheeler, except that the bend in the last section of the fourth vein is a little more abrupt.

Described from one male taken by Mr. H. S. Harbeck at Wenonah, New Jersey, June 26.

The location of the types of the new species described in this paper is as follows:

Asyndetus harbeckii, Type in the collection of Mr. H. S. Harbeck, Philadelphia.

Medeterus emarginatus, Type in the collection of the author.

Medeterus lobatus, Type in the collection of Mr. H. S. Harbeck.

Medeterus modestus, Type in Mr. H. S. Harbeck's collection.

Neurigona dorsalis, Type in the author's collection.

Neurigona nigricornis, Type in the author's collection.

Paraclius angulatus, Type in the author's collection.

Paraclius ovatus, Type in collection of Cornell University.

Peloropeodes flavipes, Type in the collection of Mr. Nathan Banks.

Psilopiella rutila, Type in the author's collection.

The location of the types of the new species described in the NEWS for November, 1914, pages 404-407, is as follows:

Gymnopternus flaviciliatus, Type in the Cornell University collection.

Leucostola terminalis, Type in the collection of Mr. Nathan Banks.

Systenus americanus, Type in the collection of Mr. Nathan Banks.

Thinophilus frontalis, Type in the author's collection.

EXPLANATION OF PLATE XVIII.

Fig. 1. *Neurigona nigricornis* n. sp., wing.

2. *Psilopiella rutila* n. gen., n. sp., wing.

3 *Neurigona dorsalis* n. sp., hypopygium.

4. *Neurigona nigricornis* n. sp., hypopygium.

5. *Paraclius ovatus* n. sp., hypopygium, side view; 6, rear view of the same, showing the form of the lamellae.

7. *Paraclius angulatus* n. sp., hypopygium.

8. *Peloropeodes flavipes* n. sp., antennae; 9, hypopygium of the same.

10. *Medeterus emarginatus* n. sp., fore coxa.

11. *Medeterus lobatus* n. sp., fore tarsus.

12. *Asyndetus harbeckii* n. sp., left antenna; 13, right antenna of the same.

Changes of Address.

Ernest Keil *from* Granville, Ohio, *to* 970 S. Villa St., Pasadena, California.

F. E. Pomeroy *from* 551 Brighton Ave., Boston, Mass., *to* 342 College St., Lewiston, Maine.

Dragonflies (Odonata) collected in Texas and Oklahoma.

By E. B. Williamson, Bluffton, Indiana.

(Continued from p. 415)

16. **Argia agrioides.**

Texas: Clifton, May 29, 30 and 31, and June 1, 37 ♂, 1 ♀; 13 ♂ in alcohol, det. Calvert.

A. agrioides was first seen by me at Clifton on a small stretch of hard, light-colored, barren, pavement-like ground, from which all the lighter soil particles had been washed. This ground had a slight slope towards a shallow dry gulley which in turn led into the small stream mentioned in the itinerary under date of May 31. These bright blue dragonflies were resting on the ground, were restless, and, when flushed, were followed with difficulty because of a sharp wind. On subsequent days I found them along the bed of the small stream. This stream, near its mouth, has steep, washed sides and, at the date when we collected, long pools of water. Towards its source it dwindles rapidly, the channel is less deeply eroded and vegetation occurs on the banks and in the stream bed. Except for a few small marshy spots near its head it is a typical wet weather gully. In this insignificant gully, with its generally apparently unfavorable conditions, 8 of the 15 species and subspecies of *Argia* known north of Mexico were taken in one day, June 1. Only 10 species of *Argia* were taken on the collecting trip. Of the 2 species not taken June 1, one (*tibialis*) was taken on both sides of Clifton and I believe will be found there, possibly a little later in the season. The other (*intruda*) was taken only at Wister, Okla. Of the 8 species taken on June 1, 4 (*translata, vivida, immunda* and *agrioides*) were not taken elsewhere than at Clifton; 1 (*violacea*) was taken also at Wister, Oklahoma; and 3 (*moesta, sedula* and *apicalis*) were taken on both sides of Clifton. Of the 4 not taken elsewhere, *translata* is of very wide distribution; *vivida* is of wide distribution in the western States and into Mexico; *immunda* and *agrioides* are southwestern and Mexican. *Violacea* is of wide distribution; and of the 3 species

taken on both sides of Clifton, *mocsta* and *sedula* are of wide distribution, while *apicalis* is of more restricted and northerly distribution. The truly remarkable Clifton list thus results from the meeting here of species of wide distribution with western and southwestern species. The distribution generally of dragonflies seems to be, within certain limits, determined by temperature and impassable barriers, subject only to the formation, age and extinction of suitable water habitats. Consider, for example, the distribution of *Ischnura kellicotti* known only from a few points in the extreme east, Indiana and Oklahoma.

In 1905 I collected 14 species of *Argia* in Guatemala. Nine species were taken at one point, Gualan, which, as in the case of Clifton, seemed favorably located to receive elements from two directions. Of the 9 species, 1 was taken at Gualan only; 1 was taken only in one direction; 4 were taken only in the other direction, and 3 were taken in both directions.

17. **Enallagma durum.**

Texas: Bay City, May 24, 1 ♂; Williams Lake, May 26, 1 ♀; Matagorda, May 25, 1 ♀.

18. **Enallagma civile.**

Texas: Brownsville, May 13 and 15, 5 ♂, 2 ♀; 1 ♀ in alcohol, det. Calvert. Nov. 25, 1910 (C. A. Hart), 3 ♂, one of them teneral; Black Bayou, May 18, 19, 20, 21 and 23, 32 ♂, 1 ♀; 11 ♂, 1 ♀ in alcohol, det. Calvert; Clifton, May 30 and 31, 5 ♂, 1 ♀; 1 ♂ in alcohol, det. Calvert.

Oklahoma: Wister, June 3, 1 ♂, 1 ♀; Henryetta, Aug. 7 and 30, and Sept. 22 (Collins), 7 ♂, 1 ♀.

19. **Enallagma traviatum.**

Oklahoma: Wister, June 3 and 4, 40 ♂, 4 ♀; 2 ♂ in alcohol, det. Calvert. Flying over the water at source of outlet of artificial lake in numbers, pairing.

20. **Enallagma geminatum.**

Texas: Williams Lake, May 26, 3 ♂, 1 ♀.

Oklahoma: Wister, June 3, 2 ♂, 1 ♀, 1 pair; 1 ♂ in alcohol, det. Calvert.

21. **Enallagma divagans.**

Oklahoma: Wister, June 3, 7 ♂, 1 ♀; 1 ♀ in alcohol, det. Calvert.

22. **Enallagma basidens.**

Texas: Clifton, May 30 and 31, and June 1, 12 ♂, 1 pair; 2 ♂ in alcohol, det. Calvert.

23. **Enallagma exsulans.**

Texas: Clifton, May 29, 30 and 31, 12 ♂, 1 ♀; 2 ♂, 1 ♀ in alcohol, det. Calvert.

Oklahoma: Wister, June 3 and 4, 3 ♂; 2 ♂ in alcohol, det. Calvert.

24. **Enallagma signatum.**

Texas: Black Bayou, May 20, 2 ♂; Bay City, May 24, 1 teneral ♂.

Oklahoma: Wister, June 3 and 4, 5 ♂, 2 ♂ in alcohol, det. Calvert.

25. **Enallagma pollutum.**

Oklahoma: Wister, June 3, 1 ♂.

26. **Telebasis salva.**

Texas: Black Bayou, May 17, 1 ♂ in alcohol, det. Calvert; Clifton, May 30 and 31, and June 1, 7 ♂, 2 ♀; 3 ♂ in alcohol., det. Calvert.

27. **Ischnura ramburii.**

Texas: Brownsville, May 13, 3 ♂, 1 hom. ♀, 2 het. ♀, and var. *credula* 1 ♂, all in alcohol, det. Calvert; Black Bayou, May 16, 21, 22 and 23, 10 ♂, 3 hom. ♀, 3 het. ♀; 1 ♂ and 1 het. ♀ in alcohol, det. Calvert; Bay City, May 24 and 27, 17 ♂, 1 hom. ♀, 6 het. ♀; Matagorda, May 25, 10 ♂, 3 hom. ♀, 6 het. ♀; Williams Lake, May 26, 5 ♂, 2 hom. ♀, 1 het. ♀.

28. **Ischnura kellicotti.**

Oklahoma: Wister, June 3 and 4, 14 ♂, 8 het. ♀; 1 ♂, 1 het. ♀ in alcohol, det. Calvert. On white water-lily leaves, identically as observed and described from Indiana.

29. **Ischnura posita.**

Texas: Black Bayou, May 22, 3 ♂, 3 ♀; Clifton, June 1, 1 ♂.

Oklahoma: Wister, June 3, 12 ♂; 2 ♂, 1 ♀ in alcohol, det. Calvert; Henryetta, Aug. 7 (Collins), 1 ♀.

30. **Anomalagrion hastatum.**

Texas: Sealy, May 10, 2 ♂, 1♀ caught near the railroad station; Brownsville, May 13, 1 ♀ in alcohol, det. Calvert; Black Bayou, May 23, 3 ♂ in alcohol, det. Calvert; Bay City, May 27, 2 ♂, 1 ♀; Williams Lake, May 26, 2 ♀; Clifton, May 31, 3 ♀.

Oklahoma: Wister, June 3 and 4, 3 ♂, 3 ♀; 1 ♀ in alcohol, det. Calvert; Henryetta, Aug. 7 and Sept. 22 (Collins), 10 ♀.

31. **Neoneura aaroni.**

Texas: Black Bayou, May 17, 1 ♂; 1 ♂ in alcohol, det. Calvert.

Several were seen but not taken on the same date and at the same place,—a small lot of drift debris on one side of a relatively deep pool in a small stream on the right bank of the Guadalupe River. From the drift the *Neoneurae* flew out to hover motionless above the deep water of the pool. As the collector approached they would disappear, leaving him to guess at the direction of their flight. I have collected several species

of *Neoneura* and the flight and actions of all have been similar. Their agility must be seen to be appreciated. And almost invariably they have been found about deep pools in small streams with drift or overhanging bushes near at hand.

32. **Hagenius brevistylus.**
Oklahoma: Wister, Aug. 3 and 5 (Collins), 10 ♂.
33. **Erpetogomphus designatus.**
Texas: Bay City, May 27, along Colorado River, 1 teneral ♀; Clifton, May 29 and 31, 4 ♂, 1 ♀, all very teneral.
34. **Gomphus submedianus.**
Texas: Bay City, May 24, 1 ♂, 1 ♀; Williams Lake, May 26, 1 ♂.
Oklahoma: Wister, June 3 and 4, 3 ♂, 2 ♀.
35. **Gomphus subapicalis.**
Texas: Bay City, May 24 and 27, 1 ♂, 1 ♀; Williams Lake, May 26, 1 ♂.
36. **Gomphus militaris.**
Texas: Black Bayou, May 18, 21, 22 and 23, 6 ♂, 10 ♀, most of them teneral or very teneral; Clifton, May 29 and 31, and June 1, 1 ♂, 5 ♀, most of them teneral.
37. **Gomphus graslinellus.**
Oklahoma: Wister, June 5, 1 ♀.

This specimen has been studied by Dr. Calvert and myself, and it seems safe to refer it to this species. *Graslinellus* about Bluffton, Indiana, has been very numerous during its season in past years, and, in the large number of specimens I have examined, considerable variation in markings is shown. For example, the black mid-dorsal thoracic stripe may be of uniform width, in which case the pale stripe on either side is wider below; or the mid-dorsal stripe may be cuneiform, in which case the pale stripe on either side is of uniform width. The dark antehumeral and humeral stripes may be entirely separated by a narrow pale stripe, or they may be partly joined or entirely coalesced to form a wide dark band of nearly uniform width. There is some variation, but less in the development of the 2 lateral dark stripes.

38. **Gomphus externus.**
Texas: Clifton, May 29, 1 ♂.
39. **Gomphus consanguis.**
Texas: Black Bayou, May 17 and 19, 1 ♂, 1 ♀; Bay City, May 24 and 27, 1 ♂, 1 ♀.

The specimens I have referred to this species, of which only the type ♂ is known, were examined by Dr. Calvert, who suggested they might be immaturely colored *vastus*. Their close relationship to *vastus* is certain, the color pattern of the head and thorax being almost identical, though the dark color is much paler and more obscured in the Texas material. In the male of *vastus* the genitalia of the second segment are black, brown in the Texas specimens; and the anterior median angle on the second hamule, seen in profile, is much stronger in *vastus*. In color of abdomen the Texas specimens are much paler than *vastus*, 7-10 being largely brownish yellow and yellow, with obscure pattern, instead of the largely black with sharply restricted yellow markings of *vastus*. Moreover, in profile, the superior appendages of *vastus* are slenderer than those of the Texas specimens.

The occiput of the female from Texas is low, nearly straight, sloping gently from either side to a slightly lower center. In *vastus* the vulvar lamina is relatively narrower than in the Texas specimens, figured here, with the sides more nearly subparallel and the 2 points of the apex contiguous.

Gomphus consanguis ♀, vulvar lamina. Black Bayou, Texas, May 19, 1907.

De Selys compared *consanguis* with *fraternus* and *adelphus*. The latter species is known to me only from descriptions. It is smaller than *consanguis*. From *fraternus*, *consanguis* is separated at once by the colored face and the thoracic markings (the more developed and cuneiform mid-dorsal stripe, and the complete, not interrupted, first lateral stripe), as well as the abdominal colors mentioned above in the comparison with *vastus*.

There is a fair degree of probability that the species here identified is not really *consanguis*, but, until the latter species has been positively determined and comparisons made directly with the Texas species, there is no justification, though the localities (North Carolina and Texas) are widely separated, for describing the latter species as new. The 2 males and 2

females from Texas in my collection are all teneral, and, in the course of study, all the male superior appendages but one have been lost. I am able to account for this only as a result of their teneral condition which seems to make the appendages extremely fragile.

40. **Gomphus plagiatus.**
Texas: Bay City, May 27, very teneral ♂.
Oklahoma: Wister, Aug. 2, 4 and 6 (Collins), 2 ♂, 2 ♀.

41. **Dromogomphus spinosus.**
Oklahoma: Wister, June 3 and 4, and Aug. 2, 4 and 5 (Collins), 9 ♂, 1 ♀; the ♂ and ♀ taken in June both teneral.

42. **Anax junius.**
Texas: Kingsville, May 11, 1 ♂ caught during a stop of the train; Black Bayou, May 18, 1 ♂; Williams Lake, May 26, 1 pair.
Oklahoma: Henryetta, Aug. 30 and Sept. (Collins), 2 ♂, 8 ♀.

43. **Epiaeschna heros.**
Oklahoma: Wister (Collins), 1 ♀.

44. **Macromia australensis.**
Oklahoma: Wister, Aug. 3, 5 and 6 (Collins), 7 ♂, 2 ♀.

45. **Macromia annulata.**
Texas: Clifton, May 30, 1 ♀.

Another individual, presumably of the same species, was seen but not taken. The flight was very swift, and, though I waited some time, the dragonfly did not return, nor were others seen. In the brief glance I got of it, and, of the one captured, the effect was of a brownish or grayish insect, not at all suggesting the Macromias I am better acquainted with in Indiana.

46. **Epicordulia princeps.**
Texas: Black Bayou, May 21, 1 teneral ♂.

47. **Platycordulia xanthosoma.**
Oklahoma: Wister, June 4 and Aug. 2 (Collins), 2 ♂.

48. **Tetragoneuria williamsoni.**
Oklahoma: Wister, June 3 and 4, 2 ♂, 1 ♀.

49. **Libellula cyanea.**
Oklahoma: Wister, June 3 and 4, 46 ♂, 4 ♀.

50. **Libellula luctuosa.**
Texas: Williams Lake, May 26, 2 ♂.
Oklahoma: Wister, Aug. 2 and 4 (Collins), 2 ♂, 1 ♀.

51. **Libellula pulchella.**
Oklahoma: Wister, June 3 and Aug. 2, 4 and 5 (Collins), 4 ♂, 2 ♀; the single specimen taken June 3 is a teneral ♀; Henryetta, Aug. 30, 1 ♂.

52. **Libellula incesta.**

Oklahoma: Wister, Aug. 2 (Collins), 46 ♂, 69 ♀. All the males have the extreme apex of wings dark, and 2 have a trace of color about the nodus in the front wings; otherwise the wings of all are unmarked. In the females the basal streaks are best developed in the front wings, sometimes being present in the front wings and wanting in the hind wings; the nodal spot similarly is best developed in the front wings. While in the females there is considerable variation in any one of the wing markings, there is also variation in the combination of these markings, as shown by the following tabulation, which is for the 69 females:

1. No basal streaks, no nodal spot, apex dark; 11 specimens.
2. No basal streaks, more or less distinct nodal spot, apex dark; 4 specimens.
3. No basal streaks, nodal spot, area between nodus and stigma, and apex dark; 5 specimens.
4. Basal streaks, no nodal spot, apex dark; 11 specimens.
5. Basal streaks, nodal spot, apex dark; 23 specimens.
6. Basal streaks, nodal spot, area between nodus and stigma, and apex dark; 12 specimens.
7. Basal streaks carried in antenodals of second series to nodus; nodus, area between nodus and stigma, and apex dark; 3 specimens.

53. **Libellula vibrans.**

Texas: Williams Lake, May 26, 1 teneral ♂.

Oklahoma: Wister, Aug. 2 (Collins), 17 ♂, 8 ♀. Of the 17 Wister males all have basal streaks, nodal spots and apex dark on all wings, except that in one specimen the nodal spot is scarcely evident in the hind wings. One specimen has the postnodals of all 4 wings edged with color. In the females the apical brown is more extensive than in the males. In one female the nodal spots are almost or quite wanting, and in 2 females there is some color on the postnodals.

54. **Libellula auripennis.**

Texas: Matagorda, May 25, 1 ♀; Williams Lake, May 26, 1 teneral ♀.

55. **Plathemis lydia.**

Texas: Williams Lake, May 26, 3 ♂, 1 ♀; Clifton, May 31 and June 1, 1 ♂, 1 ♀.

Oklahoma: Wister, Aug. 2, 5 and 6 (Collins), 9 ♂, 11 ♀; Henryetta (Collins), 1 ♂, 2 ♀.

56. **Orthemis ferruginea.**

Texas: Brownsville, May 15, 1 ♂, and Nov. 25, 1910 (C. A. Hart), 3 ♂, 4 ♀; Black Bayou, May 17, 18, 21 and 22, 11 ♂, 5 ♀.

57. **Perithemis tenera.**

Texas: Brownsville, May 13 and 15, 1 ♂, 1 ♀; Black Bayou, May

17, 18, 22 and 23, 4 ♂, 1 ♀; Bay City, May 27, 4 ♂, 2 ♀; Williams Lake, May 26, 15 ♂, 2 ♀.

Oklahoma: Wister, June 3 and 4, 9 ♂, 3 ♀; Henryetta, Aug. 20 and Sept. (Collins), 2 ♂.

The wing markings of the females from different localities vary but little, and probably the variation is not associated with locality. The female taken at Brownsville has the most yellowish of any, this color surrounding the customary darker markings. The Oklahoma females have the wing markings slightly less extensive than the others.

58. **Erythrodiplax berenice.**

Texas: Matagorda, May 25, 10 ♂, 12 ♀. Of the 12 females only 1 shows distinctly the clouded area near the nodus; another shows it very indistinctly and the rest not at all. Of the 12, 9 are heterochromatic. In these 9 there is more or less yellow at the wing bases; in one only does this reach the first antenodal, and this is in the single specimen having the colored area near the nodus. In the 3 homoeochromatic females the brown at the base of the hind wings is the merest trace and is entirely wanting on the front wings. In some apparently older heterochromatic females the thoracic dark markings are more extensive than in others and the abdomen is as dark as in the homoeochromatic females. In the youngest homoeochromatic female the thorax is shining black (dull in the others), and the abdomen is colored about as in the usual heterochromatic form. To summarize—the constant differences between the two forms in this material are confined to the head markings (as described by Calvert, B. C. A. Neur., p. 269), the thorax and the wing bases.

Four females selected at random had the following characters of the left wings tabulated (see Calvert, B. C. A. Neur., p. 268):

Number of marginal cells between		
Stigma and M2	R5 and M3	M4 and Cu1
f. w. 31, 33, 34, 36.	f. w. 23, 23, 22, 23.	f. w. 6, 10, 7, 7.
h. w. 27, 33, 35, 40.	h. w. 24, 28, 26, 28.	h. w. 13, 16, 13, 14.

In the above tabulation the first figure in each case is that of one individual, the second figure of another, and so on.

59. **Erythrodiplax umbrata.**

Texas: Brownsville, May 13 and 15, 4 ♂, 1 ♀; Black Bayou, May 17 and 23, 1 ♂, 1 ♀.

60. **Erythemis simplicicollis.**

Texas: Black Bayou, May 16, 18, 21 and 22, 2 ♂, 4 ♀; Bay City, May 24, 1 ♂; Matagorda, May 25, 1 ♂; Williams Lake, May 26, 3 ♂.

Oklahoma: Wister, June 3 and Aug. 2, 4, 5 and 6 (Collins), 2 ♂, 23 ♀.

61. **Erythemis verbenata.**

Texas: Black Bayou, May 21, 1 ♀.

62. **Lepthemis vesiculosa.**

Texas: Brownsville, May 13, 1 ♀, and Nov. 25, 1910 (C. A. Hart), 1 ♂; Black Bayou, May 17, 18 and 21, 30 ♂, 7 ♀.

This species was very abundant and very wary at the lake or pond where it was taken May 21. During the afternoon a short but heavy rainstorm came up and the *Lepthemis* at once took shelter in the alders, where they hung, often with the water pouring in a miniature stream from the apex of the abdomen. So drenched they were easily caught in the hand, but with cessation of the rain and the immediate appearance of the sun, they all took to the wing with unabated if not increased vigor.

Frequently they were observed feeding on a common fly, which has kindly been identified for me by Professor Hine as *Anthrax fulvohirta*. *Lepthemis vesiculosa* and *Erythemis simplicicollis* are the most voracious feeders known to me among the dragonflies. Both are grass green, both hunt in vegetation, especially *simplicicollis*, and I have seen *vesiculosa* strike like a falcon and kill dragonflies as large as itself.

63. **Sympetrum corruptum.**

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 5 ♂, 3 ♀, one of the males teneral; Bay City, May 24, 1 ♂.

Oklahoma: Henryetta, Sept. (Collins), 5 ♂.

64. **Pachydiplax longipennis.**

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 2 ♀, one of them teneral; Black Bayou, May 16, 17 and 18, 4 ♂, 2 ♀; Bay City, May 24 and 27, 4 ♂, 1 ♀; Williams Lake, May 26, 1 ♂.

Oklahoma: Wister, June 3 and Aug. 5 and 6 (Collins), 1 ♂, 17 ♀.

65. **Celithemis eponina.**

Texas: Williams Lake, May 26, 5 ♂, 1 ♀.

66. **Brachymesia furcata.**

Texas: Brownsville, May 13, 1 ♂; Black Bayou, May 21, 1 ♂. The one taken at Black Bayou rested in grass and low vegetation and was very wary and active.

67. **Brachymesia batesii.**

Texas: Black Bayou, May 18, 1 ♂, the only one seen.

68. **Brachymesia gravida.**

Texas: Brownsville, May 13 and 15, 2 ♂, 1 ♀; the latter has one stigma with a cross vein; Black Bayou, May 18, 20, 21 and 22, 12 ♂, 7 ♀, most of them teneral; Williams Lake, May 26, 9 ♂.

On May 20, at the lake where we collected, this species greatly exceeded in numbers all other species. They were all recently emerged and many were scarcely able to fly. These tenerals, as might be expected, kept themselves closely to the vegetation, only a few of the more mature resting on the tips of the bulrushes. With maturity this species commonly selects more lofty resting places, and at Brownsville and also at the lake at Black Bayou, visited on May 18 and 21, individuals were seen resting on the tips of bushes out of reach of the insect net. In fact, one was shot from such a lofty perch within a few yards of the spot where *B. furcata* was taken resting in the grass.

69. **Dythemis fugax.**

Texas: Black Bayou, May 22, 1 fine ♂, taken near the section house, resting on the tip of a twig of a low bush in late afternoon; the only one seen.

70. **Dythemis velox.**

Texas: Clifton, May 29, 1 teneral ♀, the only one seen.

71. **Pantala hymenaea.**

Texas: Brownsville, May 15, 1 ♀; Black Bayou, May 17 and 22, 2 ♀; Williams Lake, May 26, 1 ♂.

Oklahoma: Henryetta, Sept. 29 (Collins), 1 ♀.

72. **Pantala flavescens.**

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 1 ♂; Black Bayou, May 18, 1 ♂; Matagorda, May 25, 1 teneral ♀.

Oklahoma: Henryetta, Sept. (Collins), 2 ♂.

73. **Tramea cophysa.**

Texas: Black Bayou, May 17, 18 and 21, 12 ♂, 3 ♀; Matagorda, May 25, 1 ♂.

In all the males the frons above is metallic violet, though the area is reduced in one individual. The lateral thoracic stripes are evident in 10 males; in 3 males these stripes, especially the second, are scarcely evident. In 3 males the basal hind wing color reaches A2 and posteriorly it is on a level with the arculus; in 10 males the color reaches A3 and posteriorly it scarcely attains the level of the arculus.

In the 3 females the lateral thoracic stripes are evident; the frons above at base is rich reddish brown, in front bright yellow; the basal color on hind wing reaching A2 in 1 individual, and A3 in 2 individuals.

In Ent. News, September, 1903, p. 228, No. 46, I have recorded *Tramea abdominalis* from Nashville, Tenn. This speci-

men belongs to the same species as the Texas specimens here determined as *cophysa.*

74. **Tramea onusta.**

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 1 teneral ♀; Black Bayou, May 17, 18, 19 and 21, 21 ♂, 4 ♀; Bay City, May 24, 2 ♀.

Of 23 specimens examined for mites, 9 were infected.

In 1 male the basal color on the hind wings reaches only mid-way between the first and second antenodals, the supertriangle is scarcely colored, and the enclosed pale basal area reaches A3, at which point the colored area is only 1 cell wide. In 10 males the basal color reaches the second antenodal; in 9 males it reaches the third. In 11 males the color extends to the distal angle of the triangle; in 8 it extends 1 cell beyond. In 1 male the median space and the area beyond the upper limb of the arculus are colored; in all other males these areas are hyaline.

In the females the basal color reaches the second antenodal in 5 individuals; the third in 2 others. Color extends to the distal angle of the triangle in 5 females; a short distance beyond in 1. The median space and the area beyond the upper limb of the arculus are colored in only 1 female, hyaline in the others.

75. **Tramea lacerata.**

Texas: Brownsville, Nov. 25, 1910 (C. A. Hart), 2 ♂; Black Bayou, May 18, 2 ♂.

[*Notes on a Gomphine Exuvia from Williams Lake, Matagorda Co., Texas.*

The exuvia was collected on vegetation in the water May 26, 1907, by E. B. Williamson. No adults collected the same day throw any light on its identification. It comes close to the two exuviae described by Hagen (Trans. Amer. Ent. Soc. XII, p. 277, 1885) as "*Aphylla producta* (supposition)." The Academy of Natural Sciences of Philadelphia has a dried larva from Kissimee River, Florida, which agrees with this description. From the description quoted and the Kissimee River larva, the Texas exuvia differs as follows:

Smaller size, 43 mm. long; 6 mm. broad (in front of bases of wing pads).

"Palpus" of the "mask" with three teeth instead of four before the end hook; teeth shorter, less equally stout, the first and second proximad to the end hook being more slender than the third proximad to the end hook (*i. e.*, the most proximal tooth of all.)

Abdomen shorter (30.5 mm.), 10th segment shorter (11 mm.). (The Kissimee larva has the 10th 20 mm. long.)

The exuviae of Hagen's description and the Kissimee River larva may just as well be the early stages of the *Comphoides* recorded by Pollard* from North Carolina as they may be of *producta*. The Texas exuvia is somewhere near these, but it is impossible to say what the species may be.—PHILIP P. CALVERT.]

A new Platygasterid Genus with Remarkable Antennae (Hym.).

By ALAN P. DODD, Nelson, via Cairns, Queensland.

MIRAMBLYASPIS nov. gen.

♂.—Head transverse, a little wider than the thorax; eyes large; ocelli rather wide apart, the lateral ones distant from the eye margins by no more than their own diameter; mandibles bidentate.

Thorax twice as long as wide, narrowed anteriorly; pronotum distinctly visible from above, especially on the sides; mesonotum longer than wide, parapsidal furrows wanting; scutellum lengthened, projecting over the metathorax and terminating in a straight, sharp spine.

Abdomen broadly rounded behind; a little longer and distinctly wider than the thorax; petiolate; first segment twice as long as wide, with two carinae; second segment occupying two-thirds the abdominal length, scarcely longer than wide.

Legs extremely long; all trochanters lengthened; anterior tibiae not much lengthened, anterior tarsi fully three times as long as their tibiae; middle tibiae lengthened, middle tarsi about twice as long as their tibiae; posterior legs nearly twice as long as the whole body, posterior tibiae very long, their tarsi scarcely longer than the tibiae; tarsi 5-jointed.

Forewings very long, extending well beyond apex of abdomen; without venation.

Antennae 13-jointed, very long, as long as the posterior legs; filiform; scape, pedicel, eight funicle joints, and between each of the four apical funicle joints there is a small joint, resembling a ring joint, quite distinct, small but a little longer than

*Ent. News, xxii, p. 79. 1911.

wide; scape extremely long, about ten times as long as wide, as long as the next four joints combined; pedicel only twice as long as wide; funicle joints very slender, giving off long hairs, the hairs being several times as long as the width of the joints; the three small joints between the apical funicle joints without hairs; first funicle joint one-half longer than the pedicel; second one-half longer than the first; third shorter than the second, as long as the first; fourth extremely long, five times as long as the third, as long as the scape, but much narrower, about twenty times as long as wide; fifth about three-fifths as long as the fourth; sixth three-fourths as long as the fifth; seventh almost as long as the sixth; eighth longer, as long as the fifth. The antennae are remarkable on account of the small joints between the apical four funicle joints.

Type.—Miramblyaspis mirabilis sp. nov.

Miramblyaspis mirabilis sp. nov.

♀. Length, 2.00 mm.

Shining black; neck of pronotum, posterior edge of mesonotum, apical two-thirds of scutellum, and base of abdomen ferruginous. Legs (including coxae), mandibles, and first five antennal joints golden yellow; apex of posterior femora, and apical third of posterior tibiae, black. Thorax rather densely pilose; first abdominal segment pilose, the rest smooth. Forewings long and broad; a little infuscated; marginal cilia rather long; discal cilia moderately fine and dense.

(From 1 specimen, 2-3-inch objective, 1 inch optic, Bausch and Lomb.)

Habitat.—North Queensland (Nelson, near Cairns). Described from one ♂ caught by sweeping on edge of jungle, July 15, 1913 (A. P. Dodd).

Type.—In the South Australian Museum, a ♂ on a tag, plus a slide bearing head, antennae, and forewings.

Sympetrum obtrusum and costiferum (Odonata) in Maine.

In the Catalogue and Bibliography of the Odonata of Maine (The Univ. of Maine Studies, No. 4, August, 1902), *obtrusum* is recorded from York Harbor and Fryeburg. The capture establishing the Fryeburg locality is recorded on p. 276, ENT. NEWS, Nov., 1901, "a single specimen taken at Fryeburg, Me., August 10, 1899 (Harvey)." In the Harvey collection is a male *costiferum*, labeled, in Harvey's hand, "*Sympetrum obtrusa*, Fryeburg, Me., Aug. 14, 1899, F. L. Harvey." This is doubtless the specimen, erroneously determined as *obtrusum*, upon which the Fryeburg record is based. Ris, Coll. Selys, Libellulinen, p. 686, records as in his collection 1 ♂, 2 ♀ *obtrusum*, Manchester, Maine, Miss Wadsworth, collector.—E. B. WILLIAMSON.

Descriptions of new North American Acalyptrate Diptera—I.

By E. T. Cresson, Jr., Academy of Natural Sciences of Philadelphia.

These descriptions are published now and in this form mainly to establish priority and to eliminate the necessity of circulating manuscript names. The types are in the collection here unless otherwise noted.

Sepedon pacifica n. sp.

Cinnamon-brown to tawny. Opake with head and abdomen shining. Two spots above foramen, spot at base of frontal bristles silvery, tinged with yellow. Head higher than long. Front broader than long, orbits slightly divergent; the para- and meso-frontal areas separated by sharp and well-defined ridges running laterad from the ocellar tubercle and evanescent at lunular margin; thus the frontal bristle is situated in the depressed parafrontal. The spot laterad of antennae round and velvety black. Otherwise similar to *fuscipennis* Loew, but larger and wholly darker in color. Wings deeply tawny, and the spines on femora beneath more developed and series more extended basally. Length 9 mm.

Holotpye.—♂, Redwood Canyon, Marin Co., California, May 17, 1908 (Cresson). Type No. 6076.

Distinct from *fuscipennis* Lw., to which it is closely allied, by the broad front having the deeply sunken orbital and middle areas separated by distinct longitudinal ridges, the latter area being much more than one-third the width of the front.

Coelopa vanduzeei n. sp.

Black, opake to subopake; lunule, first and base of second joints of antennae, proboscis, trochanters and articulations of legs, yellowish-brown. Halteres yellow. Wings gray with costa, veins 1 and 2 yellow. Squamae white with yellow cilia. Legs of female brown with tarsi decidedly more yellowish. All surfaces, especially of body, covered with ochreous dust with mesonotal impressed lines black. Front, except at vertex, velvety black in certain aspects; ocellar tubercle, orbits and apices of fore and hind femora somewhat shining. Cheeks with short bristles, but those at anterior margin longer.

The three impressed mesonotal lines distinct in male. Second notopleural and postalar bristles strong; humeral, first notopleural, anterior postalar and sternopleural bristles very short. In the female all

these are equally strong and the scutellum has lateral bristles besides the erect apical pair.

Femora and tibiae of male, especially of fore and hind legs, stout and very strongly spinose, each spine emitted from a conical tubercle at its base; outer surfaces of middle femora with short spines; middle tibiae and tarsi, especially on flexor surfaces, thickly pilose with long curved pile. Female with legs more slender, the spines limited to the flexor and extensor angles and more bristle-like; no pile on middle legs. Only apical margin of fifth abdominal segment with long bristles. Length 5-7 mm.

Holotype.—♂, La Jolla, California, March 7, 1914. (E. P. Van Duzee). Type No. 6077.

Paratypes.—2 ♂, 1 ♀, with same data.

Differs from all the other species recorded from North America by the strongly spinose legs and the long pile on the middle pair. These spines are strong and straight, not curved bristles as in *frigida*. It seems allied to *parvula* Hal. in coloration.

Tetanops carbona n. sp.

Black, more or less shining, front as broad as, or broader than, eye, opake except at vertical angles, not punctate or wrinkled; the broad median yellow stripe limited laterally by narrow lines of brown which end just laterad of the antennae. Orbits broadly white, which color extends down to the cheeks, the broad median carina of face of same color; foveae shining and darker, translucent. Cheeks and lower occiput yellower, rather shining; occiput above nearly shining brown. Palpi yellow, proboscis brown. Antennae tawny to brown with apex darker; third joint twice length of second.

Thorax, abdomen and legs excepting knees and articulations shining black, but mesonotum more or less white pruinose. Squamae whitish; halteres tawny. Scutellum triangular, convex, with four bristles. 3 pair prescutellars, 1 postalar, 2 supraalars, 2 notopleurals, 1 propleural, humeral, mesopleural and sternopleural each.

Wings yellow-hyaline; marked with brown spots as follows: a spot in apex of costal cell extending faintly to vein 4, a small spot at apex of vein 1; a larger spot in apex of marginal cell extending nearly to vein 3 and along costa to apex of 4, its proximal margin about opposite post c. v.; stigma yellow; vein 1 setulose. Fore femora only setulose beneath. Length 6 mm.

Holotype.—♂, Carbon County, Wyoming. In collection American Museum of Natural History.

Paratype.—1 ♂, with same data.

Differs from all the other species in having the front and thorax smooth, without any wrinkles or punctures or punctiform dots.

Calobata nasoni n. sp.

Shining black with front, face, cheeks, mouth-parts, antennae, humeri, halteres, venter of abdomen, claspers and legs, whitish yellow to tawny. Head slightly longer than high, eyes round; occiput swollen, one-half diameter of eye. Front one-third of width of head, opake, yellow becoming tawny medianly toward ocelli; orbits silvery white continuing as stripes to a spot behind ocelli; ocellar tubercle on line with posterior orbits; orbital bristles not discernible. Face, lower occiput and palpi opake white. Antennae with third joint slightly longer than broad; arista black, short plumose basally.

Thorax narrower than head and twice as long; mesonotum polished, with a broad median stripe divided anteriorly and passing over humeri, notopleural stripe and pleurae, white pruinose, as is also the scutellum and metanotum.

Abdomen of male one and one-half times as long as thorax, broadest at segments 3 and 4; genital segments subglobose; claspers separated, broad at base, abruptly attenuate and bent forward into a long filiform apex, sparsely hairy. Between hind coxae of male posteriorly is an elongate pointed process. Genital segment of female one-half length of abdomen, subcylindrical, with cavity at base beneath, flattened laterally toward apex.

Legs very slender; posterior femora three-quarters of length of wing, with brown subapical rings, their tibiae nearly as long; other tibiae equalling their femora.

Wings hyaline, yellowish, longer than abdomen; vein 2 entering costa in a straight line midway between post. c. v. and apex; veins 3 and 4 separated apically half length of post. c. v. Length 4-6 mm.

Holotype.—♂, Algonquin, Illinois, June 11, 1909 (W. A. Nason, No. 171.) Type No. 6078.

Paratypes.—3 ♂, 2 ♀, with same data.

This species averages smaller than *pallipes* Say, which it closely resembles. It cannot be Say's species, as the vertex is tawny and the mesonotum has a broad median whitish pruinose line, while the lateral margin is only narrowly so. The differences in the genitalia will readily separate the two species.

Taeniaptera divaricata n. sp.

Black with metallic blue and black reflections. In form and size similar to *antennaepes* Say but more robust, especially as to head and

thorax, also not so highly polished. Front subopake, dark brown, the opake mesofrontal much narrower than parafrontal, scarcely attaining lunule or narrowly so. Face opake, tawny to brown with faint spots laterad of antennae and narrow oral margin black; orbits and cheeks not noticeably silvery. Antennae with second and base of third joints tawny to brown, latter two-and-one-half times longer than broad.

Thorax opake above, entirely subcinereous; prothorax, humeri, postalar region and scutellum tawny to brown. Sternopleural comb dense.

Abdomen metallic blue to black, subcinereous with third and fourth segments subopake, brown; broad apical band on first densely cinereous.

Fore coxae and femora, middle and hind femora translucent tawny to brown with yellow subapical and basal bands; fore tibiae and base of their tarsi black leaving the remaining apical joints snow white; middle and hind tibiae black, towards their apices and tarsi yellow to tawny.

Wings fuscus becoming diluted posteriorly, from base to apex of auxiliary vein, narrow band over anterior c. v., another narrow band beyond apex of first vein, hyaline. First vein ending slightly beyond the more or less oblique posterior c. v. First posterior cell closed in margin; anal cell long, ending less than length of post. c. v. before margin. Length 8-10 mm.

Male claspers short with anterior appendages as figured for *angulata* Lw. (Trans. Amer. Entomol. Soc., XXXIV, pl. ii, Fig. 12, 1908.)

Female with base of ovipositor three times as long as broad.

Holotype.—♂, Billy's Island, Okefenokee Swamp, Georgia, June, 1912. In the Cornell University Collection.

Paratypes.—4 ♂, 7 ♀, with same data.

Differs from *antennaepes* Say in having the base of fore tarsi black, longer anal cell, longer antennae and in the form of the male claspers, as well as by other characters mentioned. It should not be confused with *lasciva* Fab., a neotropical and apparently very closely related species, but which has a much longer anal cell and simple claspers.

Additions to the Entomological Collections, Carnegie Museum, Pittsburgh.

The 17th Annual Report of the Director, Dr. W. J. Holland, for the year ending March 31, 1914, states that during the year there have been added about 53,000 specimens of insects, the largest addition for any year since the purchase of the Ulke collection of Coleoptera.

A New Species of the Remarkable Hymenopterous Genus Smicromorpha with Correction of the Generic Description.

By A. A. Girault, Nelson (Cairns), Queensland, Australia.

The genus *Smicromorpha* Girault is the type of a new tribe in the family Chalcididae and was described from two broken specimens. Lately, a pair of a second species were captured from jungle in North Queensland, and these allowed the recognition of the sexes which formerly had been identified by analogical likenesses of the eyes to those of many male and female Diptera. It turns out, however, that the analogical likeness does not hold as may have been expected, since it is the female with the large eyes and the male with normal ones. The original description then should be corrected, the terms male and female turned about. The two sexes are alike except that the male has only 7-jointed antennae, the club solid, the funicle 4-jointed, no ring-joint, the antennae setiform as in the female. But also, besides the much larger eyes in the female (resembling those of many male Diptera), the abdomen is stouter distad, the ovipositor distinct but not exserted. The mandibles are alike in both sexes but very peculiar in shape, having two teeth, the first long, acute, subfalcate, the second a half shorter, rather broad, obtusely rounded at apex and separated from the first by a long, narrow sinus.

The second species of the genus is described herewith.

Smicromorpha cadaverosa new species.

♀. Length 5.00 mm. Like the type species, but with a more distinct pattern on the thorax (no pattern or practically none in the female type species): all of each parapside except margins, cephalic portion of each axilla, cephalic half of scutum except along margins and meson, caudal third of scutum except along meson and margins, forming two elongated oblique spots, one on each side, and a minute dot in the center of propodeum, dorso-laterad, dusky black; the spot on the fore wing is more distinct than in the type species. Otherwise, the same. First funicle joint tapering from apex to base.

♂. The same, but the hind coxae shorter and stouter, dusky black, the dot on propodeum absent. (The dark reddish scutum described for the male of the type species is no doubt due to fading and there is no real pattern.)

Described from a single pair captured a quarter of a mile apart by sweeping in a jungle pocket, July 28, 1913 (A. P. Dodd). The species is most probably, like its congener, parasitic upon ants.

Habitat.—Nelson (Cairns), Queensland.

Types.—In the Queensland Museum, Brisbane, the above specimens together on a tag, the two heads on a slide.

Note: The female of the above species had asymmetrical antennae, one of these latter bearing but eight joints, the other nine; the missing joint appeared to be the sixth funicle. I have reexamined the antennae of the female type species and both were 9-jointed and alike.

An Individual Variation of Lorquin's Admiral, Limenitis lorquinii Boisduval (Lepid.).

By Fordyce Grinnell, Jr., Los Angeles, California.

Limenitis lorquinii (Boisduval).

Individual Variant. ♀. Expands 72 mm. Upper side, forewings: Velvety blackish-brown, with the usual red apex, extending over about the same area, but there is considerable variation in this in specimens from the same locality. There are two white apical spots, next to the red, the upper longer and quadrangular, the lower oval; above the upper spot is a faint indication of the white continuation of the red. The band of white spots across the wings is much the same as in the typical form, but the spots are reduced in size and elongated and sprinkled with black scales. Only a faint indication of the white discal spot. Hind wings: velvety brownish-black, with only faint indications of the last three spots of the white band; and a comparatively large red anal spot clove-shaped.

Under side, forewings: The apex entirely red with no usual row of white crescents; a semi-circular area extending from the base to the inner angle and to the cell, blackish-brown; with the usual white and red spots, but much obscured with black scales.

Hindwings: *Entirely* red, with the row of median white spots and the two basal white spots very faintly indicated.

Habitat.—Arroyo Seco Canyon, San Gabriel Mts., near Pasadena, California, 1700 feet altitude, July 23, 1913; collected by Rutherford Moore, vice-president of the Lorquin Natural History Club for boys, in whose collection is this interesting specimen.

Locust Stridulations* (Orth.).

By H. A. Allard, U. S. Dep't. of Agriculture, Washington, D. C.

In August, 1913, while living at Clarendon, Virginia, just west of Washington, the writer studied the stridulating habits of *Conocephalus robustus* Scudd. This species is very common in the grass and herbage everywhere along the roadsides in this vicinity. Its note is a strong, humming z-z-z-z-z-z, which may continue several minutes without pause. It is considerably louder, more penetrating and droning in quality than the prolonged dry, snappy z-z-z-z-z of *Conocephalus triops* L., although probably not as strong and penetrating as the z-z-z-z-z-z of *C. fusco-striatus* Redt. *C. robustus* is scattered everywhere along the roadsides, rather than in well defined colonies, and stridulates most freely during the dusk of evening and early in the night.

At Clarendon, Virginia, the writer also located a small colony of *Conocephalus exiliscanornus* Davis, in a dense thicket of reeds and shrubs near a small meadow. Early in the evening the males advertised their presence by their brisk, vehement lispings, for the notes of this *Conocephalus* are brief, intermittent and rather soft. This cone-headed grasshopper appears to be strongly gregarious in its habits, as the writer has found it only in small, widely separated colonies around Washington, D. C. Wherever these colonies occur a very striking similarity in the conditions obtains. A thicket of shrubs in low grounds with an undergrowth of grasses seems to be quite indispensable to these interesting locusts.

In 1911 (1) the writer described the stridulations of *Xiphidion strictum* Scudd., from a single individual heard late in the fall. More recently the writer has again studied the stridulations of this locust at Arlington, Virginia, and finds, as previ-

(*Identifications were made by Mr. A. N. Caudell, of the U. S. National Museum.)

(1) Xiphidion Stridulations. Proc. Ent. Soc. of Washington, Vol. XIII, 1911.

ously reported, that no staccato lisps precede the long, lisping monotone s-s-s-s-s-s-s-s-s-s, which may continue several minutes without pause.

The notes of this *Xiphidion* are much louder than those of any *Xiphidion* the writer has yet become acquainted with. The long persistent monotone without the preceding staccato lisps makes the habit of stridulation of this *Xiphidion* similar to that of the species of *Conocephalus* which have acquired the habit of prolonged stridulation. Although the Xiphidions usually keep well within the grass and low herbage of fields and meadows, the writer has observed *Xiphidion strictum* resting several feet from the ground in shrubs during stridulation.

Very noticeable differences in the manner of stridulation characterize many of the species of *Xiphidion*. According to the character of the notes these insects may be grouped into three classes.

Xiphidions in the first class always produce a few, brief staccato lisps followed by a more or less prolonged lisping, monotone, or in the case of *X. nemorale,* the staccato lisps precede from two to thirty-two brief phrases rapidly repeated. A number of Xiphidions in this class stridulate in quite the same manner as the more common species of *Orchelimum*. Although barely audible, the stridulations of *X. fasciatum* in delivery and duration are an almost perfect reproduction of the staccato lisps and succeeding monotone characteristic of *Orchelimum vulgare* or *O. molossum*.

The notes of Xiphidions in the second class consist of weak, lisping phrases alone, as staccato lisps are quite wanting. The stridulations of *X. allardi* are of this character. Among the Orchelimums this is also the habit of stridulation of *O. minor*.

In the stridulations of Xiphidions of the third class, staccato lisps are also wanting, but the note is a long-continued, lisping monotone similar to that of some of the cone-headed grasshoppers, although not nearly as loud and penetrating. *X. strictum* stridulates in this manner. This habit of stridulation

among the Xiphidions is a close approach to that of the cone-headed grasshoppers *Conocephalus triops* and *C. robustus.*

From the preceding remarks concerning the musical habits of the Xiphidions, it is evident that the stridulations of these little locusts are similar to the stridulations of the Orchelimums on the one hand and to those of the cone-headed grasshoppers *Conocephalus* on the other.

Stridulation unquestionably plays a very important role in the mating activities of the musical Orthoptera. It is a part of the active courtship behavior of the males. In the immediate presence of the females, the males, under the influence of strong sexual excitement, sometimes become very energetic in their stridulatory activities. At such times, however, the notes are often interrupted and irregular, and may not represent the characteristic mode of stridulation of the species. From a study of various katydids in confinement, it is evident that something akin to a keen sense of rivalry exists between the males of a species.

A single male katydid or locust of almost any species when confined in a room will stridulate very vigorously in response to other males out-of-doors, and sooner or later will make its way to the screened window in an attempt to escape and seek its noisy rivals. Among the musical Orthoptera this sense of rivalry in a great measure appears to be one of the strongest impulses leading to the act of stridulation. The writer has spent much time among colonies of different species of musical locusts and katydids, closely observing the various movements of the individuals. In general, the females are not prone to move about as actively as the males. The males, however, as soon as the time for stridulation has arrived, become alert, restless and climb or fly more or less actively from point to point, stridulating more or less persistently in the meantime. Observation has shown that many of these movements have been made in order to approach rival males in the vicinity. The writer has repeatedly noted these movements in colonies of *Microcentrum rhombifolium, Amblycorypha oblongifolia,*

rotundifolia and *uhleri;* and in colonies of *Oecanthus* and *Conocephalus* species.

From a study of the stridulatory habits of various musical Orthoptera it has been learned that some species voluntarily change their notes from time to time. This is true for *Scudderia texensis, Scudderia furcata, Amblycorypha rotundifolia* and *A. uhleri,* so far as the writer has observed. An abrupt change by one male is very likely to call forth similar responses from other males within hearing. Just what these volitional modifications signify in the social relationships of the species is not clear.

It is quite plain, however, that stridulation in one way or another has become intimately associated with the mating activities of the musical Orthoptera. Throughout the lives of the males the greater part of all attention and interest is concerned with courtship and stridulation. Although the noisy performances of one male may excite and attract another, as it would seem in many instances, this simply means that the courtship of the female is the ultimate aim in the life of every male. Stridulation thus serves to bring more than one male within the immediate society of the female, and at the same time tends more or less toward community aggregation for many species.

A Mite Gall on Clementsia (Acarina).

The Red Orpine, *Clementsia rhodantha* (Gray), is a Crassulaceous plant which abounds at high altitudes in the Rocky Mountains. On July 7, 1914, I found it at timber line (about 11,200 feet alt.) on the side of Mt. Martha Washington, Colorado, and observed that most of the heads, instead of producing the normal pink flowers, were aborted to a dense round mass of a dark crimson-lake color, consisting of excessively tuberculated floral parts, inhabited by an Eriophyid mite. In Central Europe and Italy a similar deformation of *Rhodiola rosea* is produced by *Eriophyes rhodiolae* (Canestrini); and judging from the brief accounts given by Nalepa and Houard, it seems very probable that we have to do with the same species of mite. The number of cross-lines is about the same, and the only apparent discrepancy I note is in the great length (about 65 microns) of the first ventral setae (Nalepa says they are "mittellang"). I have not access to Canestrini's figures.—T. D. A. Cockerell.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., DECEMBER, 1914.

The Annual Entomological Meetings.

Again the Christmas holidays approach, bringing the annual meetings of the Entomological Society of America and the American Association of Economic Entomologists, in affiliation with the American Association for the Advancement of Science, and in conjunction with many other Societies of kindred interest such as the Botanical and Zoological. We print announcements of the two entomological societies on other pages of this issue. Philadelphia has the honor and pleasure of acting as host this year and the University of Pennsylvania will offer more ample and convenient facilities for the occasion than were hers on the last previous occasion in 1904. The meetings of a decade ago led to the formation of the Entomological Society of America and the birthplace will gladly welcome the sturdy child of ten years and her older sister.

The First Quarter-Century of The "News."

This present December number completes the twenty-fifth volume and the twenty-fifth year of ENTOMOLOGICAL NEWS. We, who have done the work of editing and proof-reading, of caring for subscriptions and the other financial interests of the journal, find a difficulty in realizing the length of the period which has elapsed since the first slim, pink-covered number, of sixteen pages, appeared on January 14, 1890. But on the other hand, as in many similar retrospections, we have become so used to the monthly toil and the monthly appearance that we find it equally difficult to realize the time when the NEWS was not. Without boasting, we feel that this journal has aided in the development of Entomology in America. We hope that it may continue to play this rôle for many years to come.

Of the six names of editors and advisory committee borne on the covers of the first three numbers, three are still to be found there, and among our subscribers and contributors we have the pleasure of counting some who have been with us continuously from the very beginning. All thanks to our friends, near and far, whose support has enabled the veterans and their later associates to increase and to carry on the NEWS unto this present. May their aid and that of their successors continue to us and to those who shall take our places!

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

A Method of Injecting the Tracheae of Insects.

In working on the internal anatomy of various insects, I stumbled upon a plan for injecting the tracheal system, which renders it comparatively easy for the dissector to follow this system to its smallest branches.

Place the insects in a flask and pour in just enough India ink to cover them. In the case of Coleoptera and Hemiptera it would be better to first remove the wings. Connect up the flask with an aspirator which is attached to a common water faucet. On turning on the water, the air is withdrawn from the flask by the aspirator, creating a vacuum. At the same time the air is withdrawn from the tracheae of the insects, and is replaced by the India ink. On opening up the insect, the tracheae will stand out clear and black, and can readily be followed.—E. H. DUSHAM, Instructor in Entomology, Pennsylvania State College, State College, Pa.

Callosamia promethea and angulifera (Lepid.).

During the spring I collected some cocoons of *promethea* hanging on spice-bush in my garden. They were placed in a hat box and the box covered with mosquito netting. The box was kept in a corner of a room on the third floor of my home at Ardmore, Pennsylvania. On June 27th a male and female of *promethea* emerged, and in the evening between eight and nine o'clock moths were noticed flying against the wire screen of the window of the room where the *promethea* were kept. The screens were raised and fifteen male *angulifera* came into the room and were captured. The windows were then closed. How many more would have entered had they been left open, it is not possible to say. The exact relationship between these two

has always interested me and many experiments could be carried on in relation to them. Were the male *angulifera* deceived by the female *promethea?* If the attraction is so great, what happens to the hundreds and perhaps thousands of specimens of these two in nature? Are the males of *promethea* attracted in the same way by the female *angulifera?* What are hybrids between the two like? Are such hybrids fertile? It is sometimes difficult to differentiate the females of the two. Perhaps it is foolish to speculate in regard to such matters when it is possible to ascertain the truth by direct experiment and observation. My only excuse is that this note may stimulate an interest in the subject and when opportunity affords, breeding experiments may be carried on.—HENRY SKINNER.

Annual Meeting, Entomological Society of America.

The ninth annual meeting of the Entomological Society of America will be held in Philadelphia, Pennsylvania, Thursday and Friday, December 31st, 1914, and January 1st, 1915, in affiliation with the meetings of the American Association for the Advancement of Science and other Societies. Meetings will begin at 10 A. M. on Thursday.

Blanks for abstracts of papers will be sent by the Secretary to the members, and should be returned to him not later than December 15th, in order that the program may be included in the general program of the A. A. A. S. Papers will be limited to 15 minutes in delivery.

The by-laws provide that there shall be held at the annual meeting a technical exhibit of entomological materials and methods. Photographs, drawings, specimens, novelties, apparatus, or other matter of interest to entomologists will be heartily welcomed. This exhibit will be open from December 28th to January 1st, under the charge of Dr. Philip P. Calvert, Zoological Hall, University of Pennsylvania, Philadelphia, Pa.

The business meeting will be held Friday morning, January 1st,* for the reports of the executive committee, treasurer and auditing committee, the election of new members and of officers and the transaction of all other business.

The annual public address will be given on Wednesday evening, December 30th, at 8 P. M., by Professor Stephen A. Forbes, of the University of Illinois, State Entomologist of Illinois. His subject will be, "The Ecological Foundations of Applied Entomology." Following this address, Dr. Henry Skinner, at the request of the Executive Committee, will present a history of the Society. At the conclusion, the entomologists of Philadelphia will tender a smoker to all visiting entomologists. The addresses by Professor Forbes and Dr.

*The Secretary-Treasurer writes that the date announced for the business meeting on the notices which he sent out is incorrect; it should be as given above. P. P. C.

Skinner and the smoker will be held at the Academy of Natural Sciences, Nineteenth and Race Streets.

The other meetings will be held at the University of Pennsylvania (see below).

ALEX. D. MACGILLIVRAY, Secretary-Treasurer, University of Illinois, Urbana, Illinois.

PHILIP P. CALVERT, President, University of Pennsylvania, Philadelphia, Pa.

Annual Meeting, American Association of Economic Entomologists.

The twenty-seventh annual meeting of the American Association of Economic Entomologists will be held at the University of Pennsylvania, Philadelphia, Pa., December 28th to 30, inclusive. The program will be arranged as follows:

Monday, December 28th, at 1.30 P. M. Opening session, at which will be delivered the address of the President, Dr. H. T. Fernald, which will be preceded by the transaction of the regular business of the meeting. At 8 P. M. of the same day, the meeting of the section on Apiary inspection will be held.

Tuesday, December 29th, at 10 A. M. and 1 P. M., the regular session of the Association will be continued. At 8 P. M. the opening session of the section on Horticultural Inspection will convene and another session of this section will be held at 10 A. M. on the following day.

Wednesday at 1 P. M. the closing session of the Association will be held. Thursday evening, December 31st, is left open temporarily, in case the program is too long to be disposed of at the sessions already arranged, in which case papers will be presented at a session to be held on that evening.

The meeting of the section on Horticultural Inspection will be in charge of Dr. W. E. Britton, chairman of this section, and communications in regard to program and other matters relating to the sectional meeting should be addressed to Prof. J. G. Sanders, Madison, Wis., who is Secretary of this section.

The section on Apiary Inspection will be in charge of Prof. Wilmon Newell, College Station, Texas, and communications in regard to the sectional meeting should be addressed to Mr. N. E. Shaw, Columbus, Ohio, Secretary of this section.

In accordance with our usual custom, the time allowed for presenting a paper should not exceed 15 minutes.

A. F. BURGESS, Secretary, Melrose Highlands, Mass.
DOCTOR H. T. FERNALD, President, Amherst, Mass.

Local Arrangements for the Annual Meetings.

The meetings of the Entomological Society of America (except that of Wednesday evening, December 30th, as announced above)

and all the meetings of the American Association of Economic Entomologists will be held in Class Room D, Veterinary Building, University of Pennsylvania, Thirty-ninth Street and Woodland Avenue, Philadelphia.

Hotel headquarters for both the entomological societies have been taken at the Hotel Walton, Broad and Locust Streets. The rates, for rooms only, are as follows: Single rooms, without bath, one person, $1.50 and up per day, or with bath $2.00 and up per day. Double rooms without bath, two persons, $3.00 and up per day, or with bath, $3.50 and up per day. All rooms have hot and cold running water. The Walton is three blocks from the Pennsylvania Railroad (Broad Street) Station, five blocks from the Philadelphia & Reading Railway (Market Street) station, eleven blocks from the Baltimore & Ohio Railroad (Twenty-third and Chestnut Streets) station. It is advisable to engage rooms early.

A list of other hotels, with their rates, will be found in the Preliminary Program of the American Association for the Advancement of Science.

The Veterinary Building, the meeting place for both societies, is reached, without change, by the electric cars, Route 13, on Walnut Street (one block north of the Walton), or by those of the Market Street Subway (three blocks north of the Walton), westbound, Routes 11 and 37, to Thirty-ninth Street and Woodland Avenue.

The University of Pennsylvania extends a cordial invitation to members of the A. A. A. S. and of all affiliated societies to take lunch during the meetings at the Gymnasium, Thirty-third and Spruce Streets, as its guests. The Gymnasium may be reached from the Veterinary Building direct by electric cars of Route 40, eastbound, on Spruce Street, one block north.

While it has not been possible to arrange for the entomological meetings without conflicting with meetings of allied interests, by grouping such societies in nearby buildings, attendance at different meetings will be possible with very little loss of time. The American Society of Zoologists (December 29-31), Section F, Zoology, of the A. A. A. S. (December 29-31) and the American Society of Naturalists (December 31st) will meet in the Zoological Laboratory, on the opposite side of Woodland Avenue, from the Veterinary Building. The Botanical Society of America (December 29-31), The American Phyto-pathological Society (December 30-January 1) and Section G, Botany, A. A. A. S. (December 29) will meet in the Medical Laboratory on Hamilton Walk, two blocks from the Veterinary Building. The annual dinner of the Naturalists will take place on Thursday evening, December 31st.

PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.
(Member of the Local Committee on Meeting Places.)

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings of the Academy of Natural Sciences of Philadelphia. **2**—Transactions, American Entomological Society, Philadelphia. **3**—The American Naturalist. **4**—The Canadian Entomologist. **5**—Psyche. **6**—Journal of the New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **14**—Proceedings of the Zoological Society of London. **18**—Ottawa Naturalist. **21**—The Entomologist's Record, London. **36**—Transactions of the Entomological Society of London. **40**—Societas Entomologica, Zurich. **50**—Proceedings of the U. S. National Museum. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie. **97**—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. **102**—Proceedings of the Entomological Society of Washington. **119**—Archiv fur Naturgeschichte, Berlin. **166**—Internationale Entomologische Zeitschrift, Guben. **177**—Quarterly Journal of Microscopical Science, London. **179**—Journal of Economic Entomology. **180**—Annals of the Entomological Society of America. **184**—Journal of Experimental Zoology, Philadelphia. **189**—Journal of Entomology and Zoology, Claremont, Calif. **198**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole. **230**—Revista, Museo de la Plata, Buenos Aires. **263**—Proceedings, Hawaiian Entomological Society, Honolulu. **273**—Proceedings, Royal Physical Society, Edinburgh. **274**—Archiv fur Zellforschung, herausgegeben von Dr. R. Goldschmidt, Leipzig. **313**—Bulletin of Entomological Research, London. **369**—Entomologische Mitteilungen, Berlin-Dahlem. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. **489**—Ohio Agricultural Experiment Station, Wooster.

GENERAL SUBJECT. **Crampton, G. C.**—On the misuse of the terms parapteron, hypopteron, tegula, squamula, patagium and scapula, **6,** xxii, 248-61. **Felt, E. P.**—Notes on forest insects, **179,** vii, 373-75. **Fernald, H. T.**—Notes on some old European collections, **180,** vii, 89-93. **Howard, L. O.**—An incident in the search for foreign gipsy moth parasites, **179,** vii, 378-82. Report on parasites, **180,** vii, 86-8. **McDermott, F. A.**—The ecologic relations of the photogenic function among insects, **92,** xviii, 303-7. **Morgan, T. H.**—Sex-limited and sex-linked inheritance, **3,** xlviii, 577-83. **Muir, F.**—The effect of parasitism on the struggle for existence and natural selection, **263,** iii, 30-42. **Perkins, R. C. L.**—Abnormal coupling in insects, **8,** 1914, 250-1. **Townsend, C. H. T.**—Note on a classification of sexual characters, **102,** xvi, 138-9. **Saunders, W.** —Obituary by C. J. S. Bethune, **4,** 1914, 333-6.

ARACHNIDA, ETC. **Banks, N.**—Acarians from Brazil, **5,** xxi, 160-2. **Emerton, J. H.**—New spiders from the neighborhood of Ithaca, N. Y., **6,** xxii, 262-4. **Ewing, H. E.**—The geographical distribution of our common red spider, Tetranychus telarius, **189,** vi, 121-32. **Merian, P.**—Les Araignees de la Terre de Fue et de la Patagonie, **230,** xx, 7-100.

Bacon, G. A.—The distribution of Collembola in the Claremont-Laguna region of California, **189,** vi, 137-180.

APTERA AND NEUROPTERA. **Butler, H.**—Three n. sps. of Odonata, **4,** 1914, 346-8. **Houser, J. S.**—Conwentzia hageni. Life history notes and variations in wing venation, **180,** vii, 73-6. **Jorschke, H.**—(See under Orthoptera.) **Ris, F.**—Zwei neue neotropische Calopterygiden, **369,** iii, 282-5.

Walker, E. M.—New and little-known nymphs of Canadian Odonata, **4,** 1914, 349-57 (cont.).

ORTHOPTERA. **Glaser, R. W.**—Forficula auricularia in Rhode Island, **5,** xxi, 157-8. **Jorschke, H.**—Die facettenaugen der Orthopteren und Termiten, **97,** cxi, 154-280. **Tumpel, R.**—Bau und wirkungsweise der punktaugen bei Acridium aegypticum, **92,** xviii, 275-82.

Caudell, A. N.—O. of the Yale-Dominican Expedition of 1913, **50,** xlvii, 491-5. **Davis, W. T.**—Notes on O. from the east coast of Florida, with descriptions of two n. sps. of Belocephalus. Additions to the O. known to occur in North Carolina, **6,** xxii, 191-205, 265-6. **Fox, H.**—Data on the Orthopteran faunistics of Eastern Pennsylvania and Southern New Jersey, **1,** 1914, 441-534.

HEMIPTERA. **Awati, P. R.**—The mechanism of suction in the potato Capsid bug (Lygus pabulinus), **14,** 1914, 685-733. **Bacot,**

A. W.—The influence of temperature, submersion and burial on the survival of eggs and larvae of Cimex lectularis, **313,** v, 111-18. **Browne, E. N.**—The effects of centrifuging the spermatocyte cells of Notonecta, with special reference to the mitochondria, **184,** xvii, 337-42. **Childs, L.**—The anatomy of the diaspinine scale insect Epidiaspis piricola, **180,** vii, 47-60. **Foot & Strobell**—Preliminary report on crossing two hemipterous species, with reference to the inheritance of a second exclusively male character, **198,** xxvii, 217-34. **Moore, W.**—A comparison of natural control of Toxoptera graminum in South Africa and the United States, **180,** vii, 77-85. **Parshley, H. M.**—List of the Hemiptera-Heteroptera of Maine, **5,** xxi, 139-49. **Van Duzee, E. P.**—Mr. Crawford's recent work on the Delphacinae, **5,** xxi, 163-6. **Webster & Stoner**—The eggs and nymphal stages of the dusky leaf bug Calocoris rapidus, **6,** xxii, 229-34.

Funkhouser, W. D.—New So. American Membracidae, **4,** 1914, 357-63 (cont.). **Heidemann, O.**—A n. sp. of No. Am. Tingitidae, **102,** xvi, 136-7. **King, G. B.**—The eleventh kermes from California, **189,** vi, 133.

LEPIDOPTERA. Bryk, F.—Ueber das abandern von Parnassius apollo, **119,** 1914, A, 5, 129-60. **Chapman, T. A.**—A contribution to the life-history of Agriades thersites. On a new form of seasonal (and heterogoneutic) dimorphism in A. thersites, **36,** 1914, 285-308, 309-13. **Dyar, H. G.**—The life histories of the N. Y. slug-caterpillars—XX, **6,** xxii, 223-9. **Fassl, A. H.**—Biologiches Bolivianischer tagfalter, **40,** xxix, 75-6. **Gibson, A.**—The burdock gelechid. An insect seed-destroyer, **18,** xxviii, 96. **King, J. L.**—Contribution to the life history of the lesser peach borer in Ohio, **179,** vii, 401-3. **Mosher & Webber**—The relation of variation in the number of larval stages to sex development in the gipsy moth, **179,** vii, 368-73. **Pierce, F. N.**—The genitalia of the group Geometridae of the L. of the British Islands, 88 pp. (Liverpool, 1914). **Seiler, J.**—Das verhalten der geschlechts-chromosomen bei L., **274,** xiii, 159-269.

Bethune-Baker, G. T.—Notes on the taxonomic value of genital armature in L., **36,** 1914, 314-38. **Dyar, H. G.**—Descriptions of n. sps. and gen. of L. from Mexico. L. of the Yale-Dominican expedition of 1913, **50,** xlvii, 365-409, 423-6. Utetheisa in Porto Rico. Note on Hemihyalea and some species of Amastus, **420,** ii, 129-31, 146-51. **McDunnough, J.**—Notes on the synonymy of Boisduval's North American species of Lycaenidae, **21,** 1914, 194-203. **Meyrick, E.**—Descriptions of South American Micro-L., **36,** 1914, 229-84.

DIPTERA. Alexander, C. P.—Biology of the No. American crane flies, **189,** vi, 105-120. **Hyde, R. R.**—Fertility and sterility in Drosophila ampelophila, **184,** xvii, 343-72. **Illingworth, J. F.**—Further notes on the breeding of the tachinid fly, parasitic on the cane beetle borer, **179,** vii, 390-98. **Knab, F.**—Ceratopogoninae sucking the blood of other insects, **102,** xvi, 139-41. **Metz, C. W.**—An apterous Drosophila and its genetic behavior, **3,** xliii, 675-692. **Morgan, T. H.**—A third sex-linked lethal factor in Drosophila, **184,** xvii, 315-324. **Muller, H. J.**—A gene for the fourth chromosome of Drosophila, **184,** xvii, 325-36. **Severin & Severin**—Relative attractiveness of vegetable, animal and petroleum oils for the Mediterranean fruit fly, **6,** xxii, 240-8. **Taylor, M.**—The chromosome complex of Culex pipiens, **177,** lx, 377-98. **Townsend, C. H. T.**—Progress of verruga work with Phlebotomus verrucarum, **179,** vii, 357-67. **Woodcock, H. M.**—Studies on avian haemoprotozoa: No. III.—Observations on the development of Trypanosoma noctuae (of the little owl) in Culex pipiens, **177,** lx, 399-434. **Woods, W. C.**—A note on Rhagoletis pomonella in blueberries, **179,** vii, 398-400. **Zetek, J.**—Dispersal of Musca domestica, **180,** vii, 70-2.

Aldrich, J. M.—A new Leucopis with yeliow antennae, **179,** vii, 404-5. **Alexander, C. P.**—A revision of the American species of Tanypremna and Megistocera, **6,** xxii, 205-18. **Banks, N.**—A new ortalid fly, **102,** xvi, 138. **Johnson, C. W.**—A new Stratiomyiid, **5,** xxi, 158-9. **Knab, F.**—Two No. American Syrphidae, **420,** ii, 151-3. **Malloch, J. R.**—The early stages of Metriocnemis lundbecki. Forcipomyia propinquus, a correction, **102,** xvi, 132-6, 137-8. **Walton, W. R.**—A new tachinid parasite of Diapheromera femorata. Neocelatoria ferox a synonym of Chaetophleps setosa, **102,** xvi, 129-32, 138. **Whitney, C. P.**—Descriptions of four new Tabanidae, with remarks upon Chrysops cursim, **4,** 1914, 343-6. **Willard, F.**—Two n. sps. of Platypeza found at Stanford University, **5,** xxi, 166-8.

COLEOPTERA. Dow, R. P.—The greatest coleopterist, **6,** xxii, 185-91. **Gossard, H. A.**—Orchard bark beetles and pin hole borers, **489,** Bul. 264. **Grieve, S.**—The occurrence and distribution of the beetle, Passalus unicornis, in the Antilles and the northern portion of South America, **273,** xix, 159-60. **Matheson, R.**—Notes on Hydrophilus triangularis, **4,** 1914, 337-43. **Molz & Schroeder**—Beitrag zur kenntnis der biologie des blattrankaefers (Sitona lineata), **92,** xviii, 273. **Munro, J. W.**—Notes on the reproductive organs of the pine weevil (Hylobius abietis), **273,** xix, 161-69. **Smith & Hamm**—Studies in the experimental analysis of sex.—On Stylops and stylopisation, **177,** lx, 435-61. **Wolcott, G. N.**—The cotton boll weevil in Cuba, **102,** xvi, 120-22.

Clavareau, H.—Coleopterorum catalogus, Pars 59: Chrysomelidae: Eumolpinae, 215 pp. **Fisher, W. S.**—A n. sp. of Callichroma

from Texas, **102,** xvi, 97-8. **Heinrich, C.**—A new Californian C. on plum, **420,** ii, 145. **Lewis, G.**—On new species of Histeridae and notices of others, **11,** xiv, 283-89. **Mequignon, A.**—Coleopterorum catalogus. Pars 61: Rhizophagidae, 16 pp. **Pierce, W. D.**—Descriptions of two n. sps. of Strepsiptera parasitic on sugar cane insects, **102,** xvi, 126-9. **Wickham, H. F.**—Twenty new Col. from the Florissant shales, **2,** xl, 257-270.

HYMENOPTERA. **Doncaster, L.**—The determination of sex in the gall fly "Neuroterus lenticularis," **10,** xciv, 115-16. **Natzmer, G. V.**—Das kokonspinnen der Ameisenlarven, **166,** viii, 130. **Triggerson, C. J.**—A study of Dryophanta erinacei and its gall, **180,** vii, 1-46. **Webster, F. M.**—An unrecorded parasite of Toxoptera graminum, **179,** vii, 403-4. **Wolcott, G. N.**—Notes on the life history and ecology of Tiphia inornata, **179,** vii, 382-89.

Crawford, J. C.—Notes on the chalcidoid family Callimomidae, **102,** xvi, 122-6. **Cushman, R. A.**—A revision of the N. Am. species of the braconid genus Habrobracon, **102,** xvi, 99-108. **Ellis, M. D.**—New bees of the genus Halictus from United States, Guatemala and Ecuador, **6,** xxii, 218-23. **Girault, A. A.**—Descriptions of new chalcid-flies, **102,** xvi, 109-19. **MacGillivray, A. D.**—New genera and species of sawflies, **4,** 1914, 363-7. **Myers, P. R.**—Results of the Yale-Peruvian expedition of 1911.—Addendum to the H. Ichneumonoidea, **50,** xlvii, 361-2. **Rohwer, S. A.**—Vespoid and Sphecoid H. collected in Guatemala by W. P. Cockerell, **50,** xlvii, 513-23. Descriptions of two parasitic H., **102,** xvi, 141-2. **Wheeler, W. M.**—New and little known harvesting ants of the genus Pogonomyrmex, **5,** xxi, 149-57.

THE GENITALIA OF THE GROUP GEOMETRIDAE OF THE LEPIDOPTERA OF THE BRITISH ISLANDS. An Account of the Morphology of the Male Clasping Organs and the Corresponding Organs of the Female. By F. N. PIERCE. Liverpool, F. N. Pierce, The Elms, Dingle, 1914.

Mr. Pierce is the author of a similar work on the Genitalia of the British Noctuidae, published in 1909. The present volume consists of 88 pages and 48 plates. There is an introduction of 12 pages, describing the genitalic anatomy and the nomenclature of the parts. Then follows the classification of the British Geometridae based on the structure of the male and female genitalia. The genitalia of the species are described as well as accurately figured. The whole work is largely original and shows careful study. There can be no question in regard to the wonderful aid afforded by the genitalia in systematic work. This fact is now well established by the work of careful students of the Lepidoptera both in Europe and America. One of its great values is to establish maculation and other characters between species not readily separated, but now readily differentiated by an examination of the sexual appendages. So far as we are aware, the first studies in this line in America were made by Scudder and Burgess in 1870, but they attracted little attention. In the future it will be impossible for students to neglect this fertile field of study.—H. S.

WATER REPTILES OF THE PAST AND PRESENT. By SAMUEL WENDELL WILLISTON, Professor of Paleontology in the University of Chicago. The University of Chicago Press, Chicago, Illinois. Published October, 1914. 8vo, pp. viii, 251. 131 figures. $3.00 net, postage extra, weight 2 lbs., 5 oz.

Although this volume has been sent "to the literary editor for editorial use," we confess that we would find it impossible to notice it in an entomological journal were it not that its author is a famous dipterologist. Perhaps the word "insects" may occur in it elsewhere than on page 141, but if it does it is hardly likely to be more than the incidental mention of the class to be found there. It is not given to many men in our day to achieve distinction in two groups so distinct as the Diptera and the Reptilia, and we regret that Prof. Williston has more or less abandoned the former for the latter. Certainly the extinct reptiles, of which this work chiefly treats, appeal more strongly to the imagination, by reason of their size and often grotesque shape, than do the flies, even though the influence of the latter on human existence has been, and is, a thousand fold greater. Prof. Williston's non-entomological book is very interesting both to the entomologist and the non-entomologist, and the most general chapter in it—Chapter V, on the "Adaptation of Land Reptiles to Life in the Water"—has suggestions of value even for the first kind of readers.

There is one feature of the book which we must criticise unfavorably, just as we did in speaking of another production of the same University Press in the NEWS for February last. This is its great weight *avoirdupois*. We urged then, and we repeat now, that books intended to be read should have light weight paper for the text, the heavy sort to be used only as plates for half-tones, if necessary at all.—P. P. C. (*Advertisement.*)

Doings of Societies.

ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of March 26, 1914. Mr. Philip Laurent, Director, presided. Eight persons were present.

Dr. Skinner exhibited a race of *Ambulyx strigilis* (Lepid.) from Florida, taken at Miami, by Mr. Morgan Hebard. This is the form called *carteri* by Rothschild and Jordan.

Mr. R. C. Williams exhibited specimens of *Argynnis laurenti* from Park County, Montana, taken July 5 to 7, 1913. Also *Coenonympha haydeni* and *Erebia epipsodea* from the same locality.

Mr. Rehn said he and Mr. Hebard had lately been studying the genus *Melanoplus*. The last monograph was by Scudder in 1897, while Morse has done considerable work on the genus.

The genitalia are of great importance in differentiating species. These were largely used by Scudder in his work. In certain forms the genitalia are moderately variable.

Meeting of May 28, 1914. Mr. Philip Laurent, Director, presided. Ten persons were present.

Dr. Calvert exhibited some colored drawings which he had made from living males of *Anisagrion allopterum* Selys (Odonata) in Costa Rica, which illustrate what he believes to be changes in color accompanying advancing age of the imago. The recently transformed individuals with softer chitin and no pruinosity are predominantly pale cinnamon brown. Those with firm chitin and some pruinosity are chiefly black. Both these extremes, as well as many intermediates, were obtained in the vicinity of Cartago. The pale brown forms were described by Selys as variety *rubicundum*. The speaker had suggested in the *Biologia Centrali-Americana* that such color changes as above indicated probably occurred in this species, but he did not then have the evidence in support of this view which he now possesses. If this be correct, *Anisagrion allopterum* furnishes a parallel to other species of that genus and to *Hesperagrion heterodoxum* whose color changes have been described in the *Biologia*.

Dr. Calvert also exhibited a few Costa Rican Dynastine Scarabaeidae (Coleop.) showing marked development of the cephalic or prothoracic horns and, after remarking on the very scanty information which exists as to the functions of these horns, read the verbatim statements of such observations which have been recorded for this group in different parts of the world. These indicate that in different species the horns are used as weapons, as instruments for scraping through bark, for anchoring the beetle, or for carrying the female. Photographs from a living male of *Dynastes perseus* which had been kept in a room in Cartago, Costa Rica, for a month, feeding on sugar cane, were also shown.

Mr. Laurent showed some cocoons of *Callosomia angulifera* that had holes in them that he thought were made by wood mice.

Meeting of September 27, 1914. In the absence of the Director and Vice-Director, Dr. Philip P. Calvert presided. Six persons were present.

Mr. G. M. Greene made some remarks on *Sandalus petrophya* (Col.). Mr. Liebeck said he supposed the species was always found on beech.

Mr. Rehn explained a method of collecting Orthoptera by trapping, recommended by Mr. W. T. Davis, by means of setting a Mason fruit jar into the ground with the opening level with the surface. A small quantity of New Orleans molasses, with a few drops of fusel oil, is placed in the jar. He said many little known species are collected by this method, specially mentioned the genus *Ischnoptera* and made some remarks relating to it.

Mr. Cresson reported on the progress of arrangement of the local collection.

Dr. Calvert exhibited specimens of the Odonata *Gynacantha gracilis*, *G. trifida*, *Philogenia carrillica* and *Protoneura remissa*, all of which he had taken in the same piece of dark forest on the Banana River, Costa Rica, November 9, 1909. The actual body lengths of these four individuals is 88, 63, 57 and 37 mm. The sizes of their eyes may be appreciated by giving their heights, viz.: 7.44, 5.76, 2.88, 1.11 mm. The eyes of the two Gynacanthas meet on the top of the head, those of *Protoneura* and of *Philogenia* are separated by a distance equal to the width of one eye. In spite of the smaller size of the lenses (facets) in *Protoneura*, he calculated that roughly the *Protoneura* eye has only half, or less than half, the number of facets of *G. trifida* and between three-sevenths and one-third as many facets as *G. gracilis*. Taking various factors into consideration, he concluded that the eyes of the Gynacanthas are more efficient organs than those of the other two genera. Since other dragonflies (*Anax*, *Aeshna*) with eyes almost as large as those of *Gynacantha*, are found in well-lighted places, we cannot suppose that the large eyes of *Gynacantha* are a result of shadow-haunting habits. Rather must we look on

their large eyes as giving them an advantage over insects with less efficient visual apparatus when they took to living in darkness. He also exhibited Costa Rican specimens of Lepidoptera: *Callitaera menander* found only in dark woods, whose eyes are not as large as those of *Callidryas argante* and *Daptoneura iliaire*, creatures of about the same total size, living in bright sunlight; shade-loving Ithomiine butterflies, like *Episcada apuleia*, whose eyes are not absolutely or relatively large; Sphinges and *Thysania agrippina* with the largest eyes of the order, so far as the speaker's collection was concerned, yet which are not as large as those of *Gynacantha gracilis* in spite of the heavier body and greater wing-spread of the moths.

Mr. J. W. Green, of Easton, Pa., was elected an Associate.—Henry Skinner, *Secy.*, and E. T. Cresson, Jr., *Secy. pro tem.*

OBITUARY.

We learn from the *Canadian Entomologist* for October, 1914, of the death of Dr. William Saunders at London, Ontario, on September 13, 1914, in the seventy-ninth year of his age. Beginning life as a retail druggist, he became also a fruit-grower, a Professor of Materia Medica, a public analyst, an organizer of the Entomological Society of Ontario, an editor of the *Canadian Entomologist* and Director of the Experimental Farms of the Dominion of Canada. His "Insects Injurious to Fruits" has been favorably known since its appearance in 1883. His bibliography comprises some hundreds of additional titles. The account of his active and useful career by Dr. C. J. S. Bethune, which is accompanied by a portrait, furnishes a striking example of the attainment of honorable success by one whose advantages at the beginning of life were very few, and is an incentive to all to make the best of our opportunities.

Errata.

Page 387, line 3 from bottom for "finely," read "densely."

Page 431, for line 7 substitute: the ants about 5-16 inch long; when disturbed the beetles grasp

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EXCHANGES.

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☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Chrysophanids wanted—I want very specially *Heodes fieldeni, Chalceria snowi, cupreus, rubidus, Satyrium fuliginosa.* I should like also some specimens of *Gaeides xanthoides, editha* and *gorgon.* Palaearctics, exotics or cash given in exchange.—G. T. Bethune-Baker, 19 Clarendon Road, Edgbaston, England.

Wanted—To make arrangements with dealers and collectors to furnish bred specimens of Lepidoptera for cash. Will send first class material only. New England and other species.—Sidney C. Carpenter, 49 Oakland Terrace, Hartford, Conn.

I have in papers for exchange, the rare high altitude (16,200 feet) Himalayan *Parnassius sikkimensis, hardwickei,* and *Papilio machaon sikkimensis* in exchange for American *Parnassius eversmanni* or West Coast Saturnidae.—J. Henry Watson, 70 Ashford Road, Withington, Manchester, England.

Colias interior—Fine specimens, some bred, for sale or exchange for other North American Lepidoptera.—Arthur H. Napier, Spring Lane, Chestnut Hill, Pa.

Fine specimens of the large Mantis, *Paratenodera sinensis,* offered in exchange for North American Lepidoptera or Coleoptera.—Philip Laurent, 31 East Mt. Airy Ave., Philadelphia, Pa.

For Sale or Exchange—*Catocala* from this locality for *Catocala* and other Lepidoptera not in my collection; also have fertile ova of *C. coccinata, ilia, retecta, paleogama, amatrix* and *nurus.*—Mrs. O. F. Hiser, Nevada, Iowa.

Wanted—Bibliography of American Economic Entomology, No. 4. Write offer.—Geo. M. Greene, 1303 N. 54th St., Philadelphia, Pa.

Wanted—60 *Heliophila unipuncta,* one dozen imagines of any species of any order that are very distructive to cotton. 12 cotton weevil beetles, 12 *B. disippus, P. huntera* 35, 6 pair *M. phaeton, A. celtis* 4, 4 *Debis portlandia,* 6 each of any *Papilio,* all in papers with data.—A. F. Porter, Decorah, Iowa.

Cocoons of *Actias luna* and *Philosamia cynthia* to exchange for North American Lepidoptera. Catocalae especially desired.—John H. West, 2057 East York St., Philadelphia, Pa.

I have 200 local species of named Microlepidoptera, mostly Pyralidae and Tortricidae, which I offer in exchange for North American Macrolepidoptera, Noctuidae and Geometridae particularly.—G. Chagnon, P. O. Box 521, Montreal, Canada,

Wanted to correspond with collectors in South America, to exchange Lepidoptera in papers.—Frank Prokes, 2716 South Sacramento Avenue, Chicago, Ill.

Wanted—Psyche, Vol. viii, No. 265 (May, 1898); No. 267 (July, 1898); No. 268 (August, 1898); Vol. ix, No. 300 (April, 1901). Address, giving price, Librarian, Stanford University, Cal.

For Exchange—Bred examples of *Abbottana clemataria, Empretia stimulea, Phobetron pithecium* and many other species of Lepidoptera from this locality, both Macros and Micros.—Fred. Marloff, Box 104, Oak Station P. O., Allegheny County, Pa.

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NOTICE.—**A new edition of the Naturalists' Directory has just been published by S. E. Cassino, Salem, Mass. This directory is invaluable to naturalists since it is the means of bringing together students and collectors in all parts of the world through correspondence. The directory contains an alphabetical list of English speaking professional and amateur naturalists in all parts of the world, also a list of Scientific Societies and Periodicals. The price of the Directory is $2.50 in cloth binding, and $2.00 in paper binding. Sent postpaid. As only a limited edition has been printed it is advisable for any one wishing a copy to order at once.**

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